



The sixth report of the
Nebraska Child Death Review Team
July, 2009

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The Honorable Dave Heineman
Governor, State of Nebraska

Honorable Members of the Nebraska State Legislature

This is the sixth report on child deaths in Nebraska, and is submitted for your review in accordance with Nebraska Revised Statute §71-3404. It presents findings from the Child Death Review Team's review of the 539 deaths during 2005 and 2006 of children ages 0 to 17, including trends and recommendations for reducing future deaths.

The rate of death to Nebraska children has generally been decreasing. This favorable trend is reflected in specific causes of death, most of which showed generally stable or declining numbers. However, a number of causes actually surged during this period, specifically:

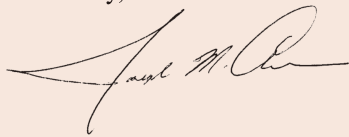
- 31 infant deaths were attributed to Sudden Infant Death Syndrome (SIDS) in 2005, the highest number since 1996;
- 36 teens took their own lives; their 2005 suicide rates were 50% higher than in 2000 and more than twice the national rate;
- Deaths from childhood cancers rose precipitously in 2004 and remained high in 2005, before declining in 2006.

Further, deaths to racial and ethnic minority children continue to be unacceptably high. Sudden infant death, and conditions related to pregnancy continue to be the largest contributors to higher mortality rates in non-White as compared to White children.

We estimate that at least one-third of all child deaths were preventable, through basic parental education and information, and child-friendly public health policies. The report includes recommendations from the state's and the nation's leading prevention and safety advocates. Some of these recommendations are aimed at state law and policy makers, but others are simple precautionary measures that communities and families can implement. We hope and anticipate that this report will encourage the people of Nebraska to focus on the safety and well-being of our state's children.

Please note that the views and recommendations of this report are those of the Child Death Review Team, and are not necessarily those of the Department of Health and Human Services.

Sincerely,

A handwritten signature in dark ink, appearing to read "Joseph M. Acierno", with a stylized, flowing script.

Joseph M. Acierno, M.D., J.D., Deputy Chief Medical Officer
Chair, Nebraska Child Death Review Team
Nebraska Department of Health and Human Services

The Child Death Review Team would like to thank the County Attorneys and their staff, hospital Medical Records Departments, Tribal Authorities, State agencies, DHHS staff, family members and other individuals who graciously provided the information that made this report possible. Special thanks go to Shirley Pickens-White of DHHS and Steven Gabriel of the Douglas County Attorney's Office for their contributions.

This report was designed to provide useful information for evaluation, planning and prevention purposes. Any questions or comments regarding the report or the Nebraska Child Death Review Team should be directed to:

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This report is also available at
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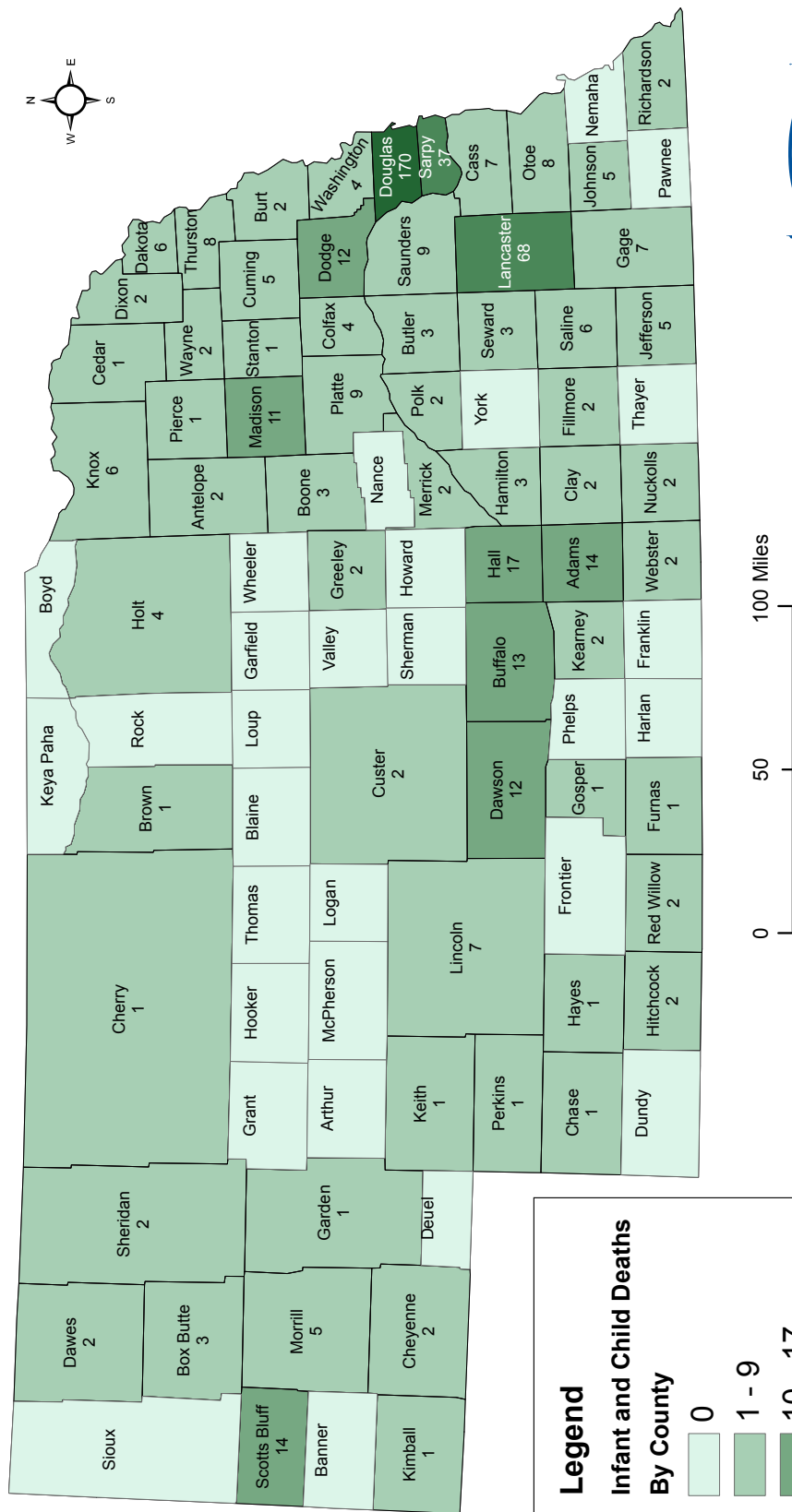


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Any man's death diminishes me, because I am involved in mankind...

John Donne, Meditation XVII

Executive Summary

The Nebraska Child Death Review Team (CDRT) was established by the Nebraska Legislature in 1993 and charged with undertaking an ongoing, comprehensive review of existing information regarding child deaths in Nebraska. This report presents the CDRT's findings and recommendations based on review and analysis of deaths of the 539 Nebraska resident children (newborns through 17 years of age) who died during 2005 and 2006.

The overall death rate of children in Nebraska was 19% lower in 2005-2006 than in 1993 when child death reviews began. This reflects a drop from 332 deaths (76 deaths / 100,000 children 0-17) to a two-year average of 270 deaths (64 deaths / 100,000 children). Death rates of African-American, American Indian and Hispanic children continue to be higher than those of White and Asian children.

Top causes of death were conditions related to pregnancy, birth defects and motor vehicle incidents. Overall, 36% of all cases were determined to be "strongly" or "somewhat" preventable.

Top Five Causes of Death for Children in Nebraska, 2005-2006, and Key Recommendations for Prevention of Future Deaths

1. Pregnancy-Related – 134 deaths

Factors related to pregnancy accounted for 25% of all child deaths during 2005-2006. Underlying causes of these deaths were largely split between premature birth with no known cause and maternal complications; incompetent cervix, placental abruption and uterine infections were the most common maternal complications. Most (66%) pregnancy-related deaths were not scored for preventability.

Preconception care should be considered a vital and routine aspect of care for all reproductive age women.

Women with known high risk pregnancies should be referred to birthing hospitals with appropriate levels of care ("perinatal regionalization").

2. Birth Defects – 102 deaths

Birth defects accounted for about one in three infant deaths and one in five of all deaths. Heart defects and chromosomal anomalies were the most common types of lethal defects. The causes of most birth defects are unknown. However, women who do not take multi-vitamins (particularly ones including folic acid), who use alcohol, tobacco or other drugs, who have shorter intervals

between pregnancies, who are overweight or who have diabetes are at higher risk of having a child with birth defects. One third (32%) of birth defect-related deaths were not scored for preventability; only 16% were classified as strongly or somewhat preventable.

Healthy lifestyles, regular folic acid supplements before and during pregnancy, and pre-conception medical care remain the best protection against birth defects.

3. Motor Vehicle-Related Incidents – 77 deaths

Eighty-six percent of motor vehicle-related deaths were of children in a vehicle either as a driver or passenger. Over half of the deaths were to teens ages 15 to 17. Alcohol was known to be involved in 18% of deaths. Only three cases did not have enough information to be scored for preventability. The rest (96%) were felt to be strongly preventable - attributed to driver error or poor judgment along with inexperience.

Nebraska's safety belt law should be upgraded to primary (standard) enforcement. Seat belt use should be a primary offense for teen drivers.

The American Academy of Pediatrics recommends passage of legislation in all states prohibiting the use of 3- and 4-wheeled off-road vehicles (ATV) by children younger than 16 years. Children do not possess the physical strength, coordination, or judgment necessary to pilot these vehicles safely.

4. SIDS / SUID – 53 deaths

A dramatic increase in the number of sudden unexpected infant deaths (SUID) occurred in 2005. Of 53 total SUID cases during 2005 and 2006, many were likely due to unintended suffocations rather than the traditional “unexplainable” phenomenon of Sudden Infant Death Syndrome (SIDS). All but three were documented with at least one of eight major risk factors for a sleep-associated death. All SUID/SIDS cases were scored for preventability; half (52%) were felt to be strongly or somewhat preventable.

Comprehensive dialogue needs to be generated among health professionals, consumer groups, cultural organizations and others on the importance of back sleeping and the risks of bed sharing.

Regulations for licensed child care facilities should include putting infants to sleep on their back, removing stuffed toys from cribs, and repealing requirements for crib “bumper pads.”

5. Infectious, Chronic & Other Medical Conditions – 37 deaths

Thirty-seven children died from medical conditions ranging from various pneumonias (11 cases) to seizure disorders (2 cases). Eight children died from long-term complications of cerebral palsy. Most (82%) of these cases were not assessed for preventability.

The single best way to prevent seasonal influenza and other infectious childhood diseases is for children to receive regular vaccinations.

B ackground

Review of 2005-2006 Nebraska Child Deaths

The Legislature finds and declares that it is in the best interests of the state, its citizens and especially the children of this state that the number and causes of death of children in this state be examined. There is a need for a comprehensive integrated review of all child deaths in Nebraska and a system for statewide retrospective review of existing records relating to each child death. §71-3404 Neb. Rev. Stat.

This report presents the findings and recommendations of the Nebraska Child Death Review Team, based on the review and tabulation of the 539 deaths of Nebraska resident children (newborns through age 17) known to have occurred during 2005-2006. The traditional belief that “things will happen” ignores the reality that many of these deaths could have been prevented.

BACKGROUND

The Nebraska Child Death Review Team (CDRT) was established by the Nebraska Legislature in 1993 and charged with undertaking a comprehensive, integrated review of existing records and other information regarding each child death. At that time, the Nebraska Commission for the Protection of Children had found that about 300 children died each year in the state, but that there was no systematic process in place for consistent review of those deaths to determine contributing circumstances.

The purpose of the CDRT includes developing an understanding of the number and causes of child deaths, and advising the Governor, Legislature, other policy makers and the public on changes that might prevent them in the future. All child deaths are reviewed, not just “suspicious” or violent ones. The Team uses information in written records and the expertise of its members to identify situations where, in retrospect, reasonable intervention might have prevented a death. Members of the original Team determined that the specific goals of these reviews would be to:

- Identify patterns of preventable child deaths;
- Recommend changes in system responses to child deaths;
- Refer to law enforcement newly-suspected cases of abuse, malpractice, or homicide; and,
- Compile findings into reports designed to educate the public and state policy makers about child deaths.

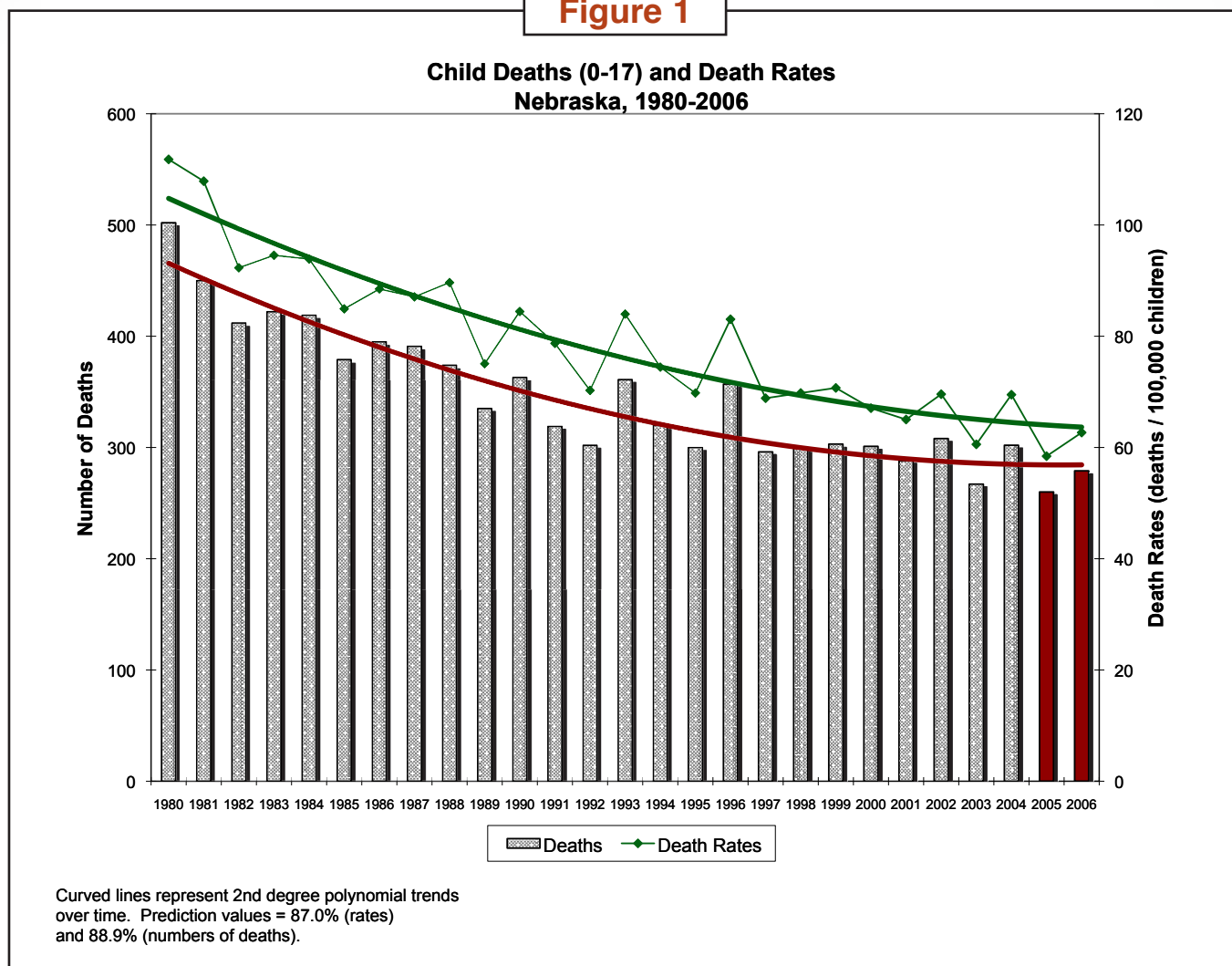
Five previous reports have been issued, covering child deaths in 1993, 1994-1995, 1996-2001, 2002-2003 and 2004.

Findings

A total of 539 Nebraska children ages 0 to 17 died during 2005-2006, an average of 270 deaths per year (Table 1). This represents a 19% decrease from 332 deaths in 1993 (when child death reviews began), and a 15% decrease in the death rate (from 76 deaths per 100,000 children 0-17 to 64 per 100,000)¹. Despite year-to-year fluctuations, the overall trend since 2000 has been towards fewer deaths (Figure 1).

Nebraska's 2005 child death rate of 62.1 per 100,000 is comparable to the 2005 U.S. rate of 62.8.

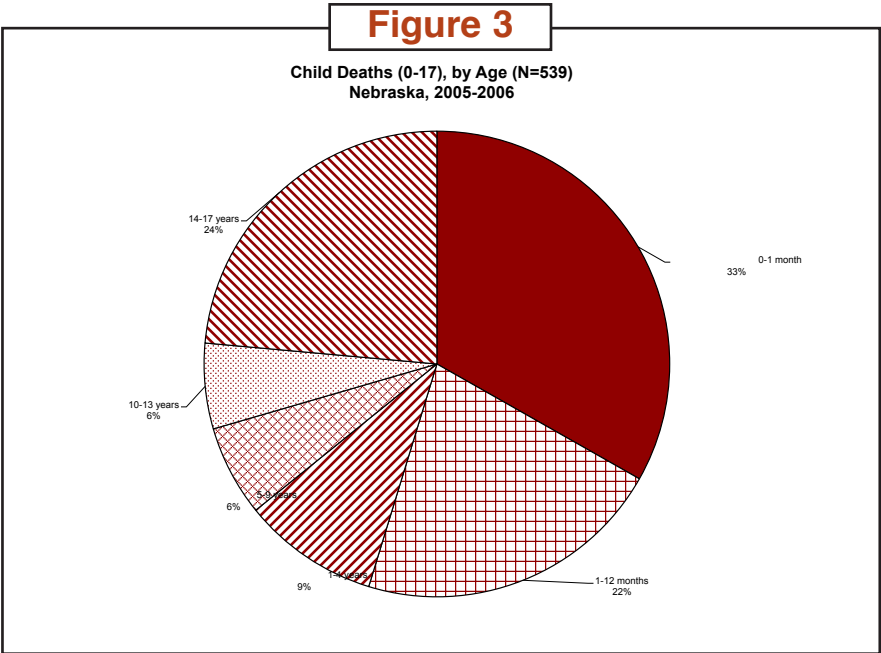
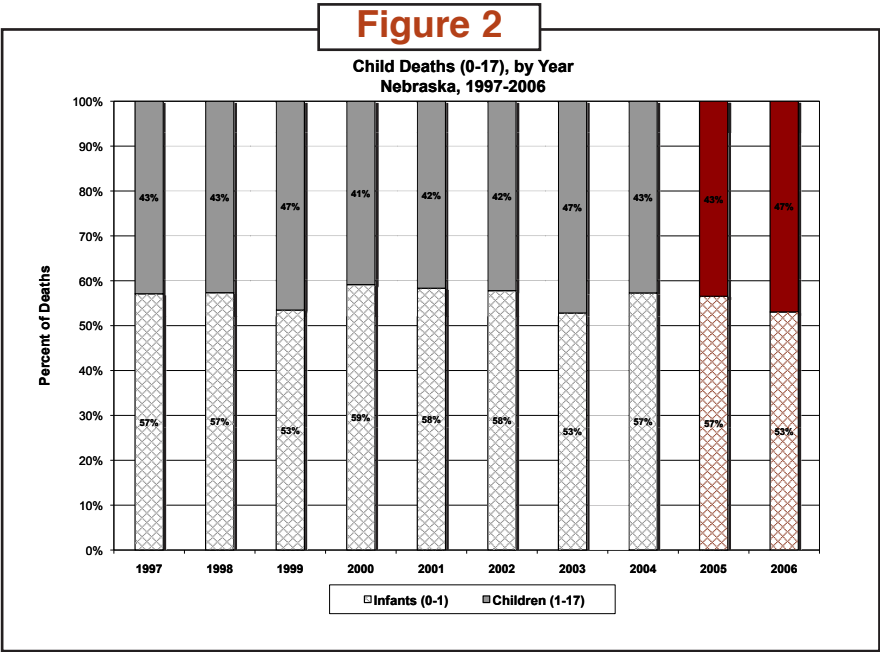
Figure 1



¹ Previous reports stated 361 deaths (82.6/100,000) for 1993.

Demographics

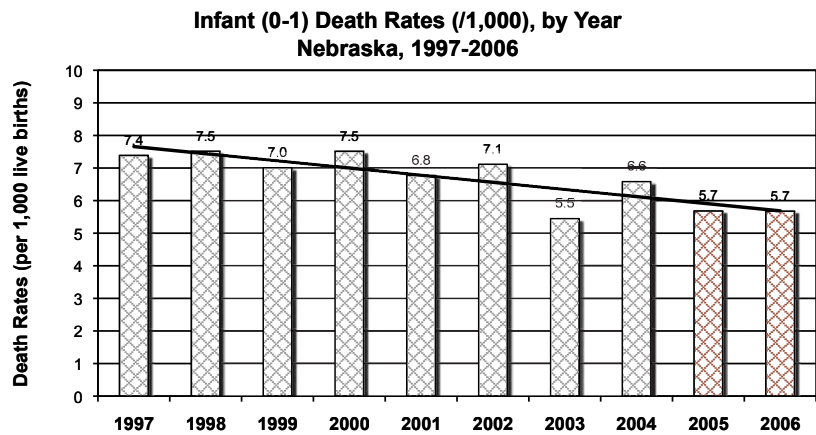
Slightly over half of all deaths (55%) were of infants less than 12 months old; this is consistent with previous years (Figure 2). Of these, over half (61%) died in their first month (Figure 3).



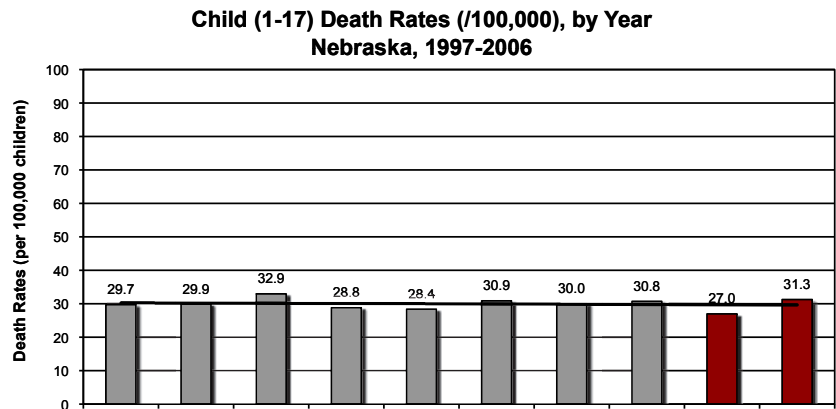
Infant mortality rates in Nebraska have been declining over the past decade, whereas child (ages 1-17) mortality has showed little change. Nationally, the infant mortality rate was stagnant between 2000 and 2005 (6.8 to 7.0 per 1,000 live births) before dropping to 6.7 per 1,000 in 2006.

In 2005, Nebraska’s infant and child death rates were among the lowest of the past decade, but then rose slightly in 2006.

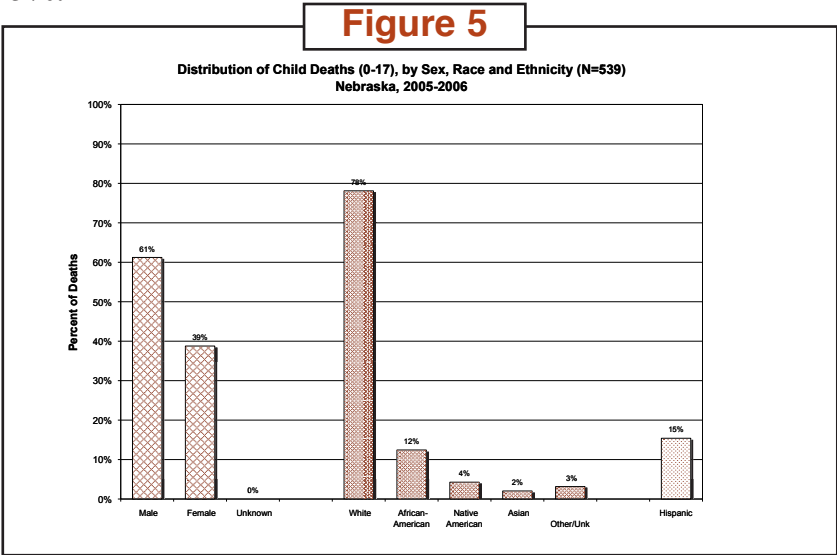
Figure 4



Straight lines represent the linear trends over time.

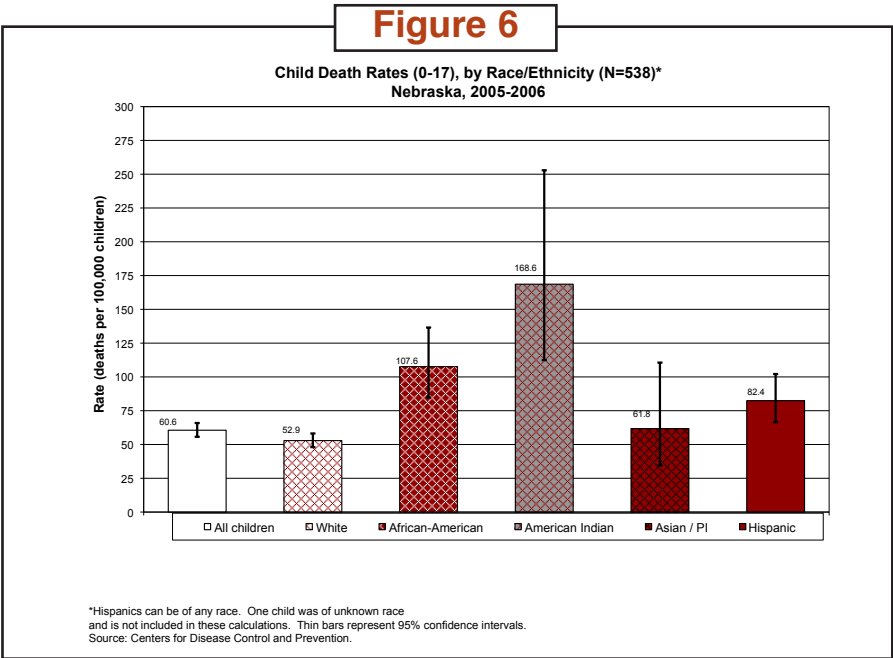


As in past years, the children were predominantly male (61%) and White (78%; Figure 5). African-American children made up 12% of deaths, American Indian 4%, Asian 2% and Hispanic² children 15%.



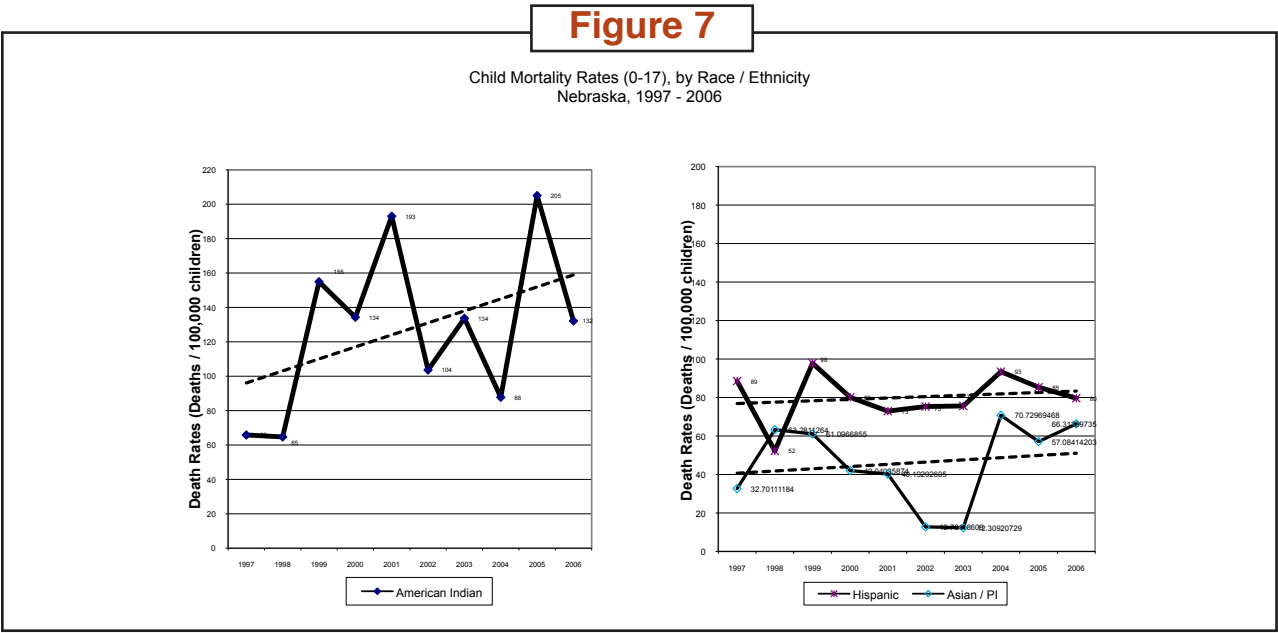
When calculated as rates of death per 100,000 children, African-American, American Indian and Hispanic children had significantly higher death rates than did White children (Figure 6).

The death rate of Asian children was also higher than that of White children; however, it is based on a small number of deaths and the difference is not statistically significant.



² Persons of Hispanic origin may be of any race, thus race and ethnicity percentages sum to greater than 100 percent.

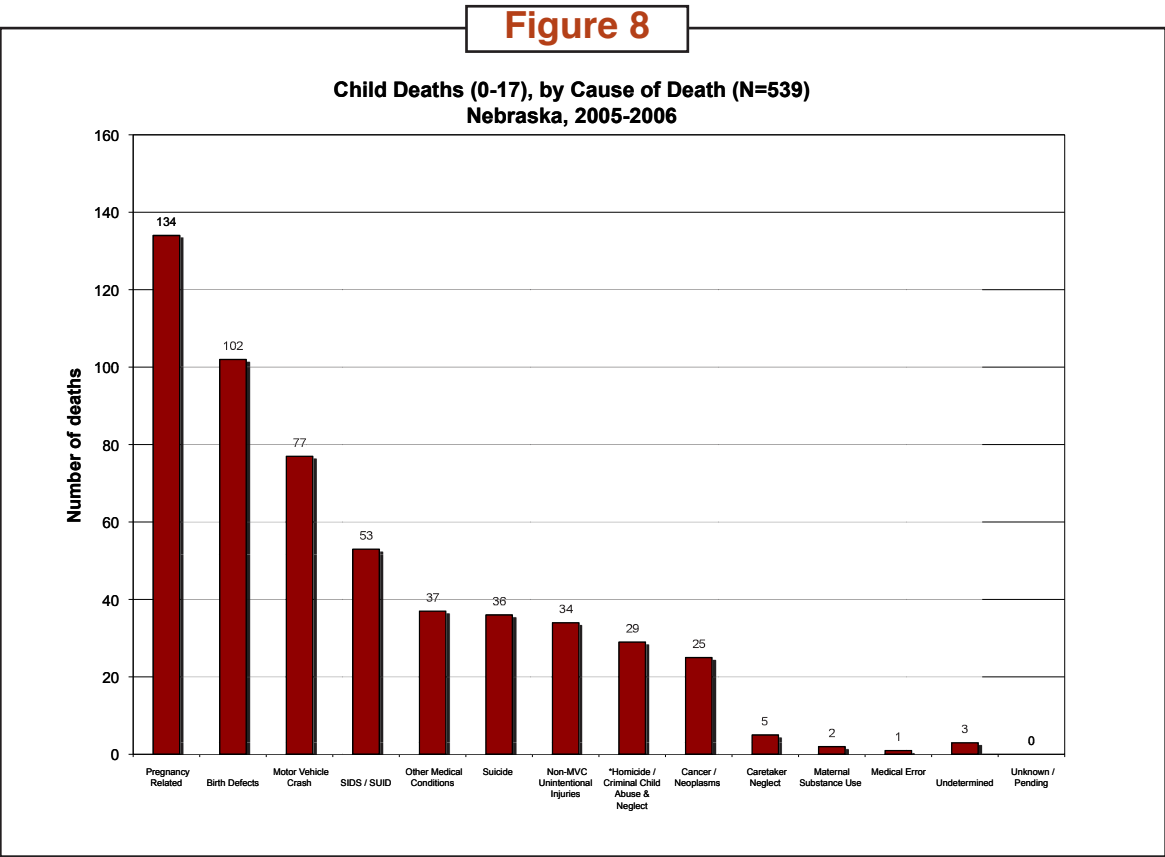
Between 2004 and 2005, the number of American Indian deaths increased sharply from 6 to 14, pulling the 10-year trend upwards (Figure 7). This increase included two American Indian suicides, double the number reported over the past decade. Hispanic children have been experiencing a gradual increase in mortality. Deaths to Asian children jumped from one to six between 2003 and 2004 and have remained high; no single contributing cause of death could be identified.



Causes of death

Overview

One-quarter of all child deaths during 2005-2006 were attributed to “Pregnancy-Related” causes, a combined category of maternal complications during pregnancy, labor and delivery problems, and prematurity (Table 1; Figure 8).



Birth defects were the second most common underlying cause of death (21%); motor vehicle crashes continued to be the third largest cause (14%).

One-third (34%) of all deaths were attributed to non-medical conditions.

Preventability

Although all deaths are reviewed for manner and circumstances of death, assessing the “preventability” of each death has been a goal of the CDRT for many years. After struggling with the concept, the Team decided that it was not possible to distill every situation, which were often very complicated, into a simple yes/no conclusion. A 5-point Likert Scale of preventability was thus developed. For each case reviewed, reviewers assessed whether they:

Strongly Disagreed	Somewhat Disagreed	Were Neutral / Undecided	Somewhat Agreed	Strongly Agreed
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with the statement:

- “This death was preventable - standard-of-care medical management would have changed the circumstances that led to death.” (Medical cases);
or,
- “This death was preventable - an individual or community could reasonably have done something that would have changed the circumstances that led to death.” (Non-medical cases).

Over 60% of cases were individually assessed for preventability. Remaining cases were largely due to medical conditions that were less likely to be preventable. The Team is working towards a goal of assessing 100% of each year’s deaths.

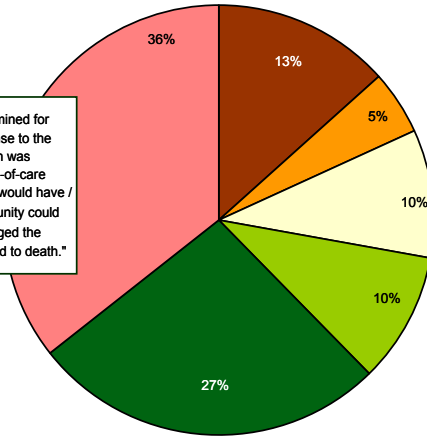
Preventability (“strongly agree” or “somewhat agree”) ranged from 100% for medical error and 96% for motor vehicle-related deaths, to 1.5% for pregnancy-related deaths and 0% for cancer deaths (Figure 9).

Overall, 37% of all deaths were determined to be somewhat or strongly preventable. When considering only cases that were individually assessed for preventability, 57% were felt to be somewhat or strongly preventable.

Figure 9

**Preventability of Child Deaths
Nebraska, 2005-2006**

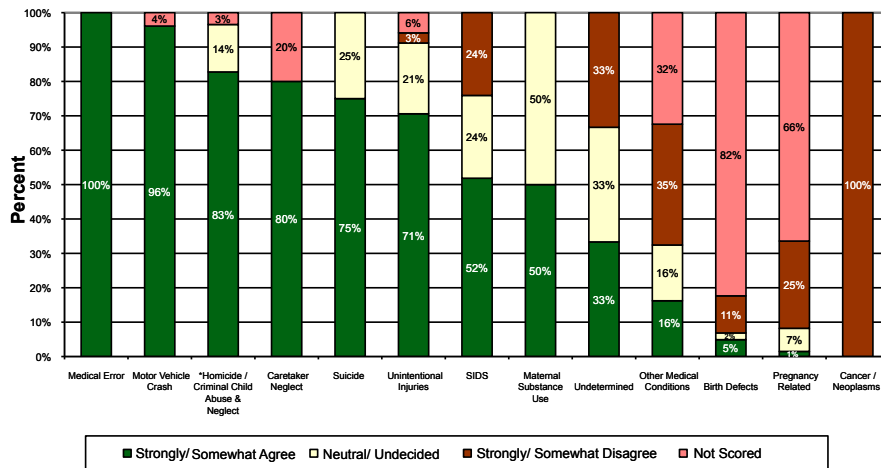
Preventability is determined for each case as a response to the statement: "This death was preventable - standard-of-care medical management would have / an individual or community could reasonably have changed the circumstances that lead to death."



- Strongly Disagree
- Somewhat Disagree
- Neutral/ Undecided
- Somewhat Agree
- Strongly Agree
- Not Scored

Figure 9

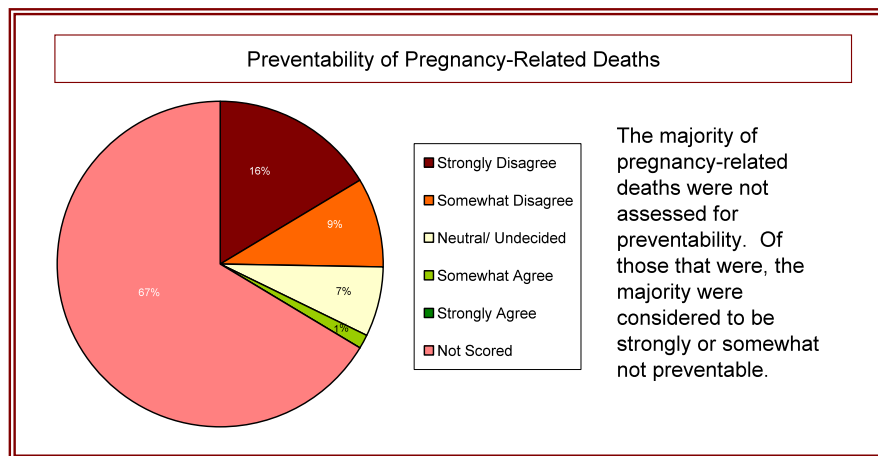
**Preventability of Child Deaths, by Cause
Nebraska, 2005-2006**



Pregnancy-Related Deaths - Key Findings

Factors related to pregnancy accounted for 25% of all deaths during 2005-2006 (Table 1). Among these 134 children, the underlying causes of death were evenly split between maternal complications and premature birth (Table 2). Incompetent cervix, placental abruption and uterine infections were the most common maternal complications (Table 3). Of the 63 children with no identifiable cause of their prematurity, twenty-nine were multiple gestation infants (twins, triplets and quadruplets), representing 46% of all prematurity deaths (Table 4). Another four infants died from specific neonatal conditions (Table 4).

Of 126 premature infants who died from a pregnancy-related cause, half (52%) had an identifiable cause for their preterm delivery.

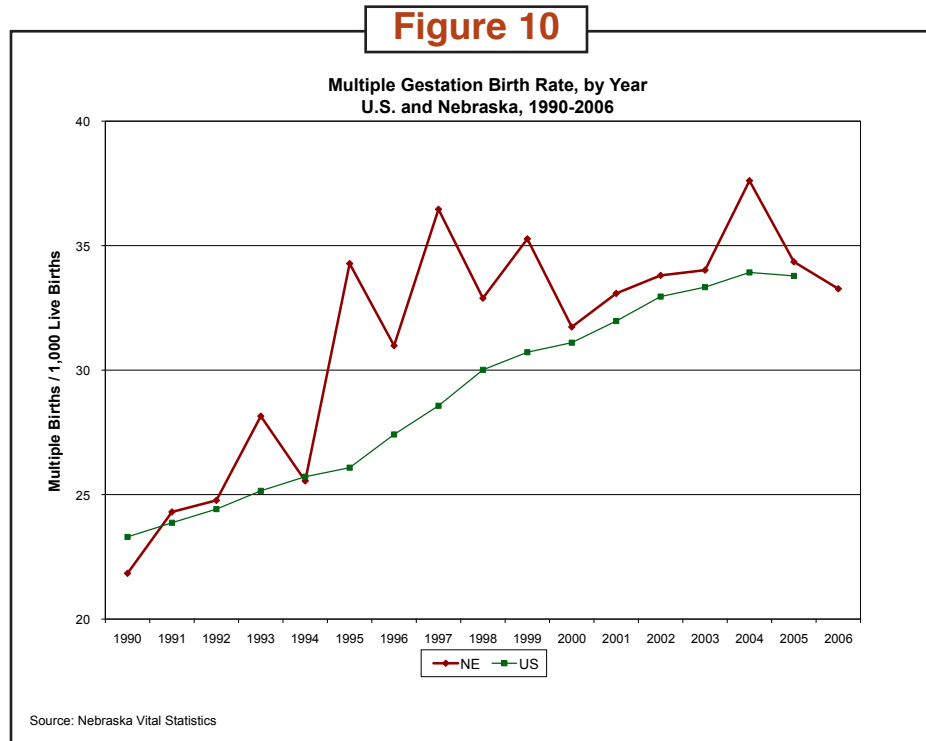


Discussion. Premature birth continues to be a leading cause of infant mortality, with rates highest among African-American infants. While the specific causes of prematurity are not well understood, many cases can be attributed to a known condition. Of the 15 maternal complications identified, many involved preventable infections (Table 3).

Cervical cerclage, the (temporary) mechanical closing of the cervix, is the predominant treatment option for incompetent cervix. However, researchers have not been able to show clear and consistent benefits from the procedure. The ability to distinguish patients with conditions that would respond to cerclage appears to be key to its effectiveness.

Premature labor is considerably more common in multiple gestation than singleton pregnancies, resulting in a disproportionate number of multiple gestation infants among infant deaths. While averaging only 3% of live births between 1996 and 2006, during that same period between 12% and 23% of all infant deaths were of multiple gestation infants. Although most multiple gestation

infants survive, they often have severe health problems. The rate of multiple births has declined recently in both the US (2005) and Nebraska (2005-2006; Figure 10).



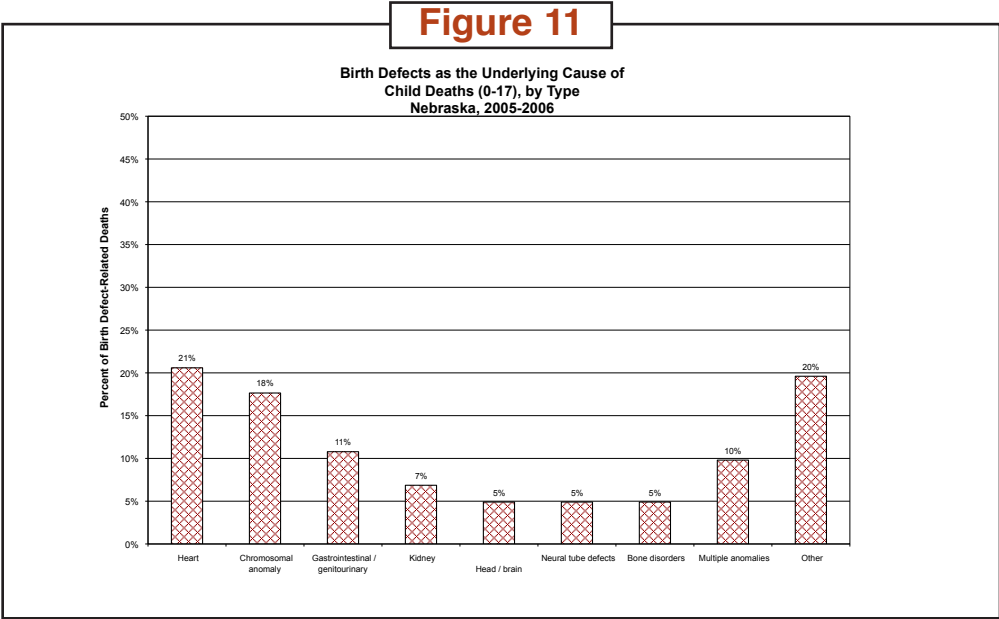
Other known risks associated with increases in premature birth rates include increasing use of planned caesarean sections and induced births. Further analysis is needed to understand their contribution to prematurity in Nebraska.

Recommendations *To help reduce infant and child death and disability from pregnancy-related conditions:*

- Preconception care should be considered a vital and routine aspect of care for all reproductive age women.
- All women should have access to affordable prenatal education and care.
- All prenatal providers should be able to recognize and refer known high risk pregnancies to birthing hospitals with appropriate levels of care (“perinatal regionalization”).
- The use of caesarean sections that are not required for the health of the mother or baby should be discouraged.
- Continued research is needed on the early identification of women at risk for preterm labor and methods to prevent it.

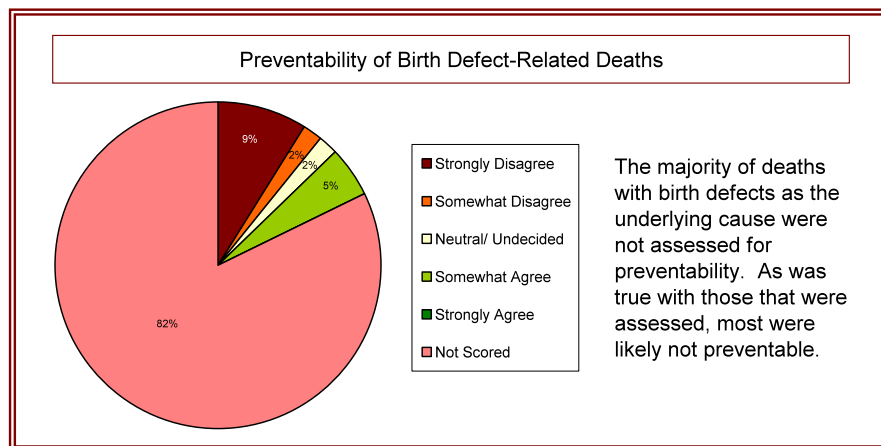
Birth Defects / Congenital Anomalies - Key Findings

Birth defects accounted for about one in three infant deaths (102 deaths, 35%) and one in five of all deaths (102 deaths, 19.0%), making it the second largest cause of death category. Heart defects (21 cases) and chromosomal anomalies (18 cases) were the most common types of lethal defects (Table 5; Figure 11). Five infants died from neural tube defects, which are considered largely preventable through regular preconceptional intake of folic acid.



All infants born in the state of Nebraska are screened for 26 specific metabolic and genetic diseases. Although cases are rare, early detection allows early treatment of these potentially debilitating or lethal diseases.

During 2005-2006, 68 Nebraska newborns were diagnosed with a screened disorder; none of these infants is known to have died.



Discussion. Nationally, about 3% of babies are born with a birth defect; Nebraska's 2005 rate was comparable at approximately 2.6%. Down syndrome (Trisomy 21), Edwards' syndrome (Trisomy 18) and Patau syndrome (Trisomy 13) are the most commonly occurring chromosomal anomalies in the U.S. Most infants born with extra copies of chromosomes 13 or 18 die during their first year of life whereas the survival rate for Down syndrome is considerably higher. Nationally, about 1 in 1,000 babies are born with Trisomy 13 and 1 in 3,000 with Trisomy 18, similar to the Nebraska rate of approximately 1.4 in 1,000 births (2005-2006). Increasing maternal age is the only commonly accepted risk factor for most trisomies, although the majority of affected births actually occur to younger women.

The causes of most other birth defects, including other chromosomal anomalies, are unknown. However, women who do not take multi-vitamins (particularly ones including folic acid), who use alcohol, tobacco or other drugs, who have shorter intervals between pregnancies, who are overweight or who have diabetes are at higher risk of having a child with birth defects.

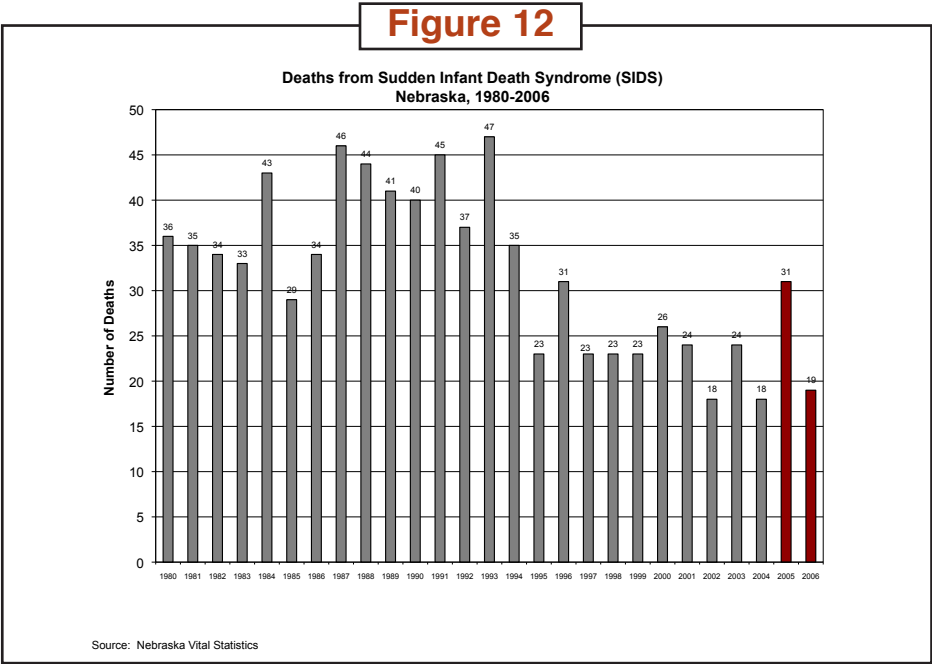
Recommendations *To help reduce infant and child death and disability from birth defects:*

- Healthy lifestyles, pre-conception medical care, and regular folic acid supplements before and during pregnancy should be key parts of women's health messages.

Sudden Infant Death Syndrome (SIDS) / Sudden Unexpected Infant Death (SUID) - Key Findings

The number of deaths attributed to Sudden Infant Death Syndrome (SIDS) has declined considerably in Nebraska over the past 25 years (Figure 12). SIDS is officially defined as the sudden death of an infant less than one year of age which remains unexplained after a thorough medical and legal investigation, and is commonly perceived as a death that "nothing could have prevent-

ed.” In contrast, Sudden Unexpected Infant Death (SUID) is an unofficial diagnosis that refers merely to the unexpectedness of the death and leaves open the issue of a distinct cause. In both cases most, although not all, infants die in their sleep.

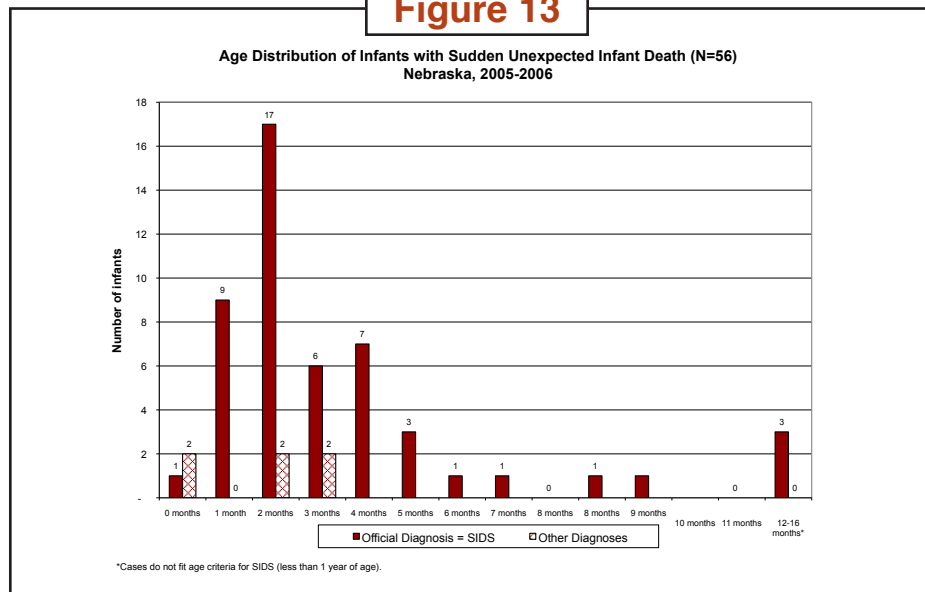


Of the 50 infant deaths officially attributed to SIDS during 2005-2006, three were of children over one year old and thus are not considered in the discussions below (Table 6). Six additional infants who died in their sleep were *not* diagnosed as SIDS, but had medical or other records similar to infants who in the past had been so diagnosed.³ These 53 infants are thus considered together in the broader “sleep-associated” or SUID category.

Deaths occurred in 26 different Nebraska cities; the infants were disproportionately African-American (17%) and were more likely to be male (59%; Tables 7-8). Similar to previous years, approximately 19% of the sleep-associated deaths were known to have occurred while the child was in a child care setting (licensed or unlicensed; Table 9). Figure 13 shows the age distribution of the children; most of the deaths occurred before five months.

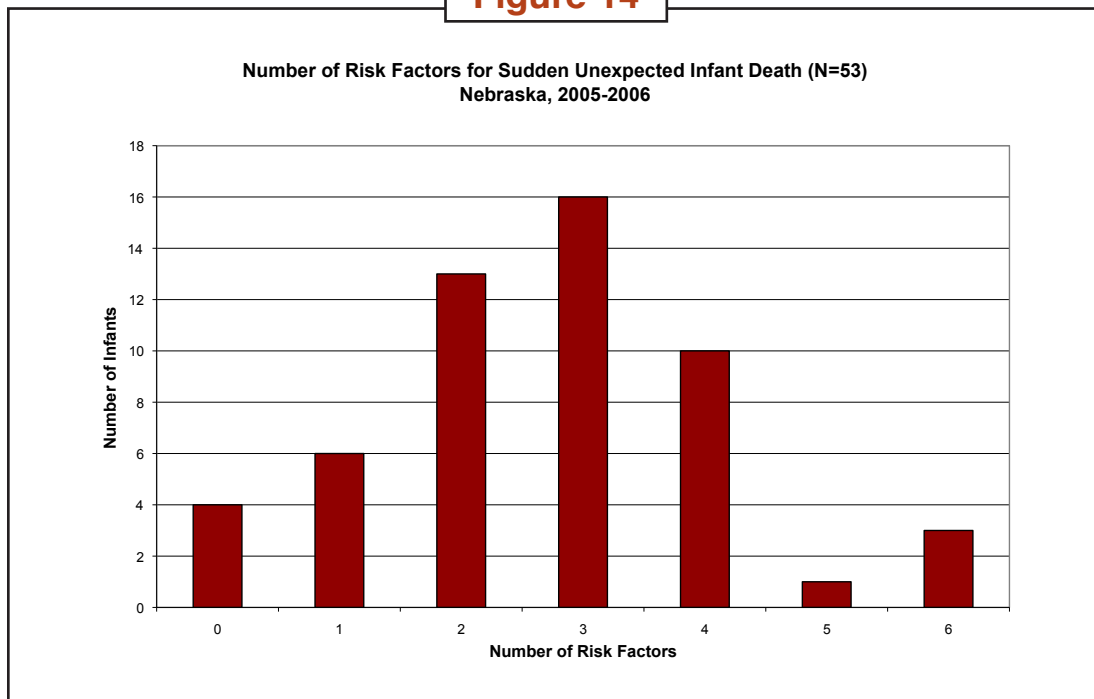
³ Their causes of death were originally reported as accidental suffocation (three cases), “undetermined” (two cases) and “respiratory arrest” (one case).

Figure 13



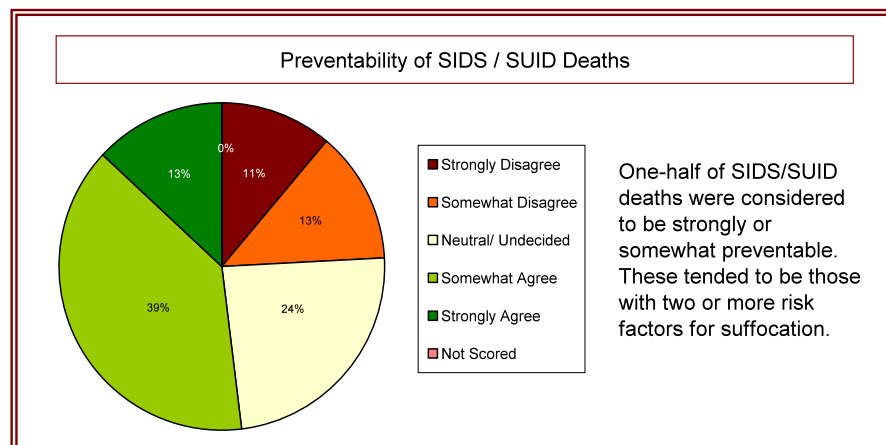
Of the 53 SUID cases, all but four (93%) were documented with at least one of eight major risk factors for a sleep-associated death; the children averaged 2.7 reported risk factors each (Table 10; Figure 14).⁴

Figure 14



⁴ Missing data were considered as not having the risk factor. All four infants without documented risk factors were missing information on at least two of the risks.

- One-half (51%) of infants were sleeping in or on something other than a safety-approved crib, playpen or baby bed.
- One-half (47%) of infants had documented pre- or post-natal exposure to tobacco smoke, considerably higher than the most recent estimated statewide smoking prevalences of 26.1% before pregnancy, 16.0% during the last trimester of pregnancy and 20.8% after the birth (PRAMS, 2005-2006).
- At the time of death, 45% of infants were sleeping with or on an adult or other child. Published estimates of “usual” bed sharing range from 13% to 51%. The most recent Nebraska estimate is 20% (PRAMS, 2005-2006)
- Forty-two percent of infants were reported to have current or recent respiratory infections, a likely contributor to impaired breathing.
- Seventy-four percent of infants were reported as having been put to sleep on their backs; 57% were reported as having been found on their backs. The most recent Nebraska estimate for infant back-sleeping is 77% (PRAMS, 2005-2006).



Discussion. Sudden deaths in infancy have dropped considerably over the past decade as many parents have recognized the dangers associated with infants sleeping on their stomachs, and adopted the recommendations of the “Back to Sleep” campaign. However, many deaths that are called “SIDS” appear to be unintentional suffocations. Excess blankets and pillows, sleep surfaces not designed for an infant, second-hand tobacco smoke and other impediments to infant breathing have emerged as major risk factors for the sudden death of infants, particularly but not only when they are sleeping on their stomachs. Small infants may not be physiologically mature enough to overcome otherwise minor challenges to their breathing, particularly during sleep. While the scientific understanding of sudden infant death continues to evolve, the American Academy of Pediatrics (AAP) risk reduction policy statement, available on the AAP web site, has several straightforward recommendations based on the best available evidence.⁵

⁵ <http://aappolicy.aappublications.org/cgi/reprint/pediatrics;116/5/1245.pdf>.

2005 saw a dramatic increase in the number of SIDS cases from previous years. Many of these cases occurred in Douglas County. In response, the county's "Baby Blossoms Collaborative," an organization of 35+ area agencies and individuals, has focused on preventing sleep-associated infant deaths by promoting back-sleeping and discouraging bed sharing. Their campaigns have featured bus signs, bill boards, and health fair and media promotions.⁶ More such efforts are needed in communities across the state.

Recommendations

In response to a request by the Nebraska Chief Medical Officer, the CDRT conducted an in-depth analysis of 12 SIDS-attributed deaths occurring between January 1 and March 31, 2005.⁷ In addition to documenting similarities among the deaths, the report made several recommendations for better understanding and prevention of sleep-associated infant deaths, including:

- **A comprehensive, investigative review of the circumstances is needed for all unexpected infant deaths.** Investigations should include a doll reenactment by a trained investigator. Comprehensive investigations improve everyone's understanding of what may have happened.
- **Full analyses - toxicologic, microbiologic, radiologic and vitreous chemistry, in addition to a complete autopsy, performed on all cases of unexpected infant death.** Toxicological analyses should also be performed on their caretakers.
- Regulations for licensed child care facilities should include putting infants to sleep on their back, removing stuffed toys from cribs, and repealing requirements for crib "bumper pads."
- Comprehensive dialogue needs to be generated among health professionals, consumer groups, cultural organizations and others on the importance of back sleeping and the risks of bed sharing.
- The public health community and others should continue to use and promote the latest research on classification of sleep-associated deaths, to improve public understanding of how to prevent these deaths.

Further recommendations:

- **Breastfeeding advocates and safe sleep advocates need to work together to develop a unified message for mothers and families.** While bed-sharing with an infant may enhance the important practice of breastfeeding, it also carries a strong risk of infant suffocation.
- Obstetric and prenatal care providers need to be aware of the dangers of bed sharing, and are encouraged to convey this information to their patients.

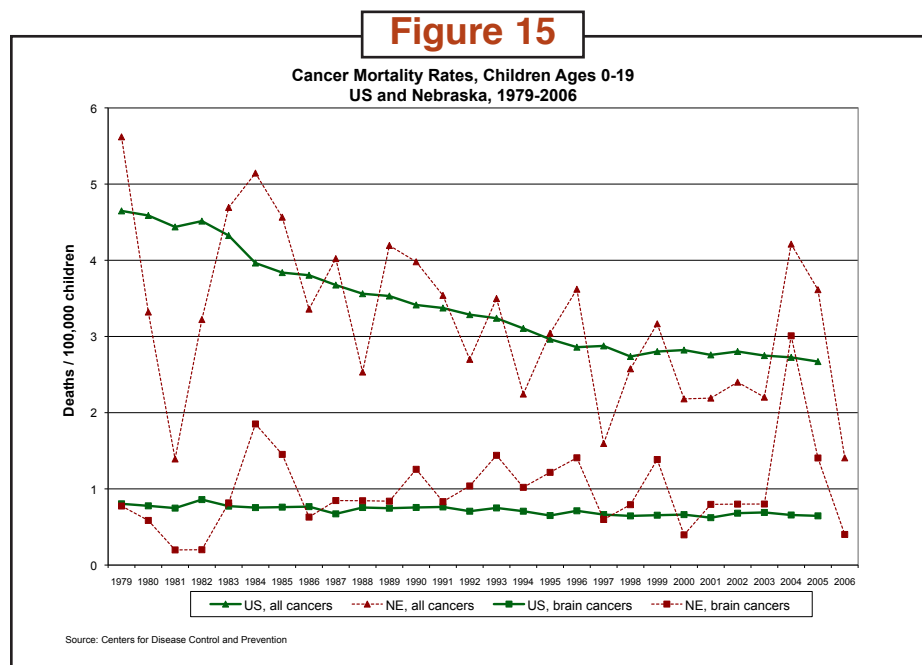
⁶ http://www.douglascountyhealth.com/children/safe_sleep_campaign/index.html

⁷ Report available at <http://www.dhhs.ne.gov/srd/2005-SIDS-Report.pdf>.

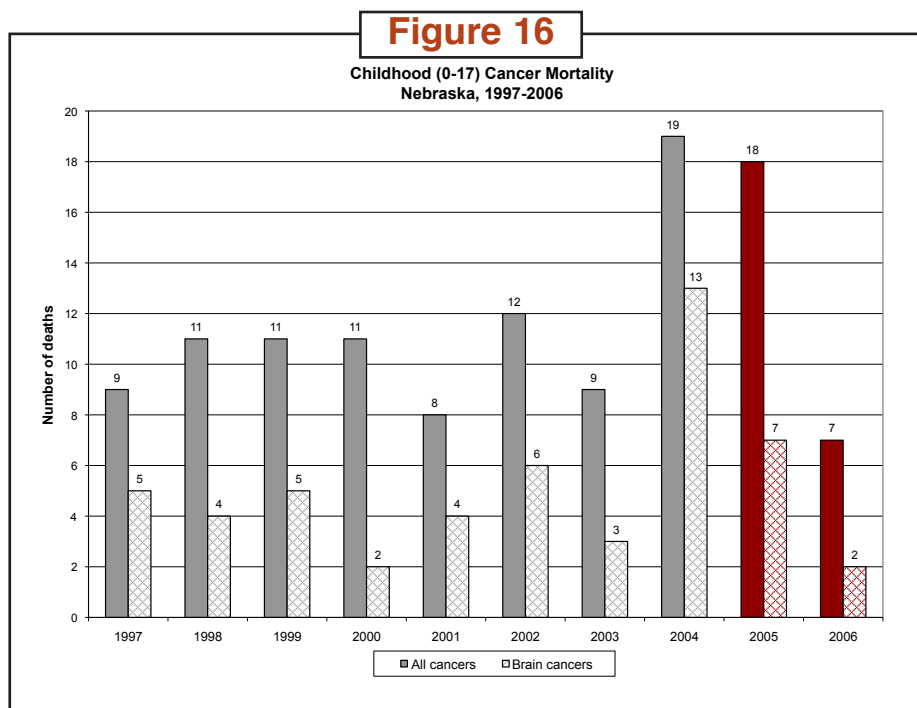
Cancer / Malignant Neoplasms - Key Findings

Childhood cancer is not one disease, but rather a spectrum of different types of tumors with different causes. Nationally as well as in Nebraska, White children are more likely to develop cancer than any other ethnic group. Among the major types of childhood cancers, leukemias (blood cell cancers) and brain and other central nervous system (CNS) tumors account for over half of new cases.

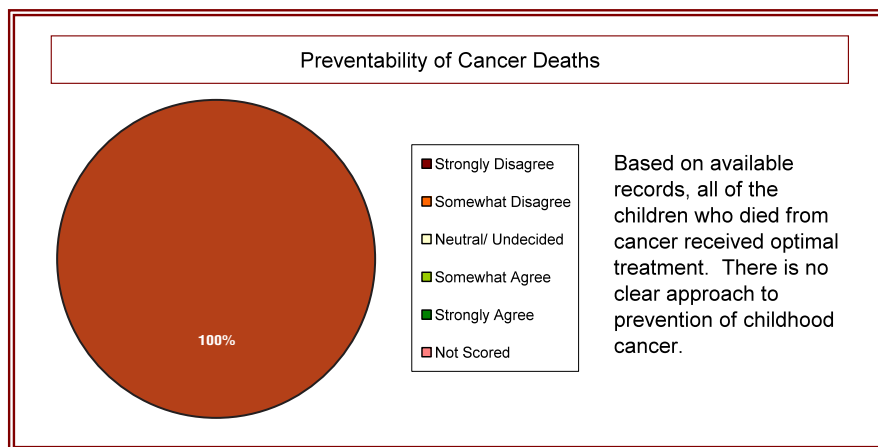
Nationally, childhood cancer deaths have been declining (Fig. 15, upper lines). Although highly variable due to the small number of cases, Nebraska's rate has followed the same overall pattern as the national rate. However, while nationally the subset of deaths due to brain cancer has been largely unchanged, it increased sharply in Nebraska in 2004 (Figure 15, lower lines). Although a relatively small number, the 13 brain cancer cases that year represented a rate of 3.0 deaths per 100,000 children, a significant increase from the 1994-2003 yearly average of 0.96 deaths per 100,000 children. Brain cancer mortality subsequently dropped in 2005 and 2006 (Table 11; Figure 16).



Unfortunately, the decrease in brain cancer deaths was partially offset by a small increase in deaths from liver cancer and neuroblastomas, and the overall Nebraska rate remained high (3.6 per 100,000 children) in 2005 before plummeting in 2006 (Table 11; Figure 16).



After being elevated in 2004, Nebraska's 2006 death rates from all childhood cancers and childhood brain cancers were among the lowest of the past two decades.



Discussion. National statistics show that childhood cancer kills more children each year than asthma, diabetes, cystic fibrosis and AIDS combined. The small numbers of cancers that occur in any given geographic area make it difficult to identify clear risk factors. A few known conditions, such as Down syndrome, other specific chromosomal and genetic abnormalities, and ionizing radiation exposures explain a small percentage of cases. Research is beginning to show increased

risk for childhood brain tumors associated with life on a farm and farm animal exposures, and a lower risk associated with maternal prenatal vitamin intake. The unexplained spike in deaths seen in 2004 appears to have subsided. Nonetheless, the Nebraska Cancer Registry, the Comprehensive Cancer Control Program (“Nebraska C.A.R.E.S.”)⁸ and the CDRT will continue to monitor childhood cancer occurrence and risk factors.

Recommendations *To help reduce child death from cancer:*

- **Providers should stay up to date on findings regarding risk factors for, causes of and treatments for childhood cancers.** Children diagnosed with cancer should be enrolled in clinical trials in order to receive access to the newest experimental treatments.

Infectious, Chronic and Other Medical Conditions

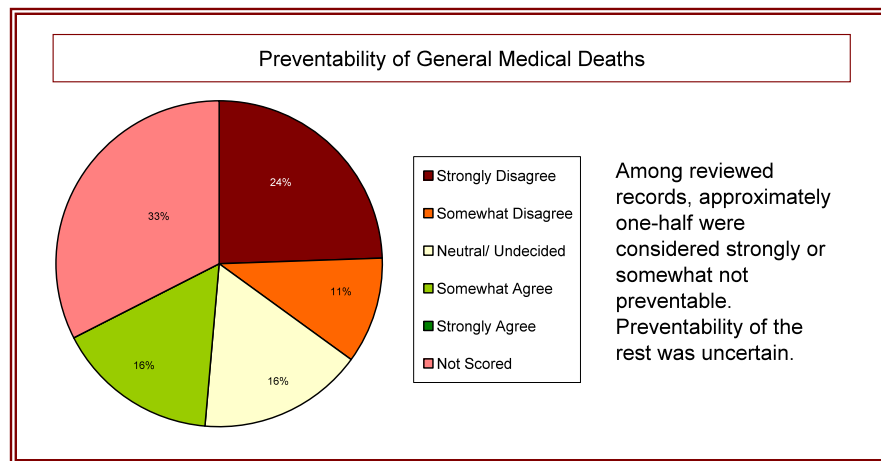
The 37 “other” medical cases (Table 12) cover a wide range of causes. Infectious disease-related deaths in infants at least one week old and who were not preterm are included here, recognizing that there is some overlap with pregnancy-related conditions. At the same time, children who died from complications of maternal infections, e.g., herpes virus, are considered in the Pregnancy-Related section, again acknowledging the overlap between categories.

Influenza is typically the leading cause of vaccine-preventable death in children. However, of eleven respiratory illness-related deaths in 2005-2006, only one was specifically attributed to influenza. Four children died from pneumonias caused by rotavirus, cytomegalovirus (CMV), methicillin-resistant *Staphylococcus aureus* (MRSA), and Respiratory Syncytial Virus (RSV). Five additional children’s medical records listed the cause of death as various types of “pneumonia” or “bronchitis” without specifying a specific causal agent.

Only two asthma-related deaths were reported during 2005-2006. Other fatal conditions included cerebral palsy and its complications (8 cases), liver failure (3 cases), and seizure disorders (2 cases).

The single largest non-pregnancy-related medical cause of death was from complications of cerebral palsy.

⁸ The State Cancer Control Plan is available at <http://www.hhss.ne.gov/hew/hpe/NebraskaCARES/about.htm>.



Discussion. Nationally, cerebral palsy affects 2-3 children per 1,000, afflicting both sexes and all ethnic and socioeconomic groups. Cerebral palsy is actually a variety of neurological disorders that appear in infancy or early childhood, affecting body movement and muscle coordination but not worsening over time. Infants born before 28 weeks gestation have a 50-fold elevated risk when compared with infants born at term. While the majority of children with cerebral palsy are born with it, some cases result from preventable causes such as a lack of oxygen during the birth process, brain infections (e.g., bacterial meningitis, viral encephalitis), or head injury from a motor vehicle accident, a fall, or child abuse. Of the eight Nebraska cases, four appear to be related to post-natal causes; two were clearly documented with prenatal origins. Because the children were between three and 17 years old, early medical records for the rest were not available.

Asthma is the leading chronic illness of children in the United States and the leading cause of school absenteeism due to chronic illness. Even mild cases can lead to death. Frequent use of albuterol inhalers and emergency injectors is a warning that a child's asthma is not being properly controlled. Although recent studies have shown that proper use of inhaled corticosteroids decreases asthma deaths, since 1996 a majority of Nebraska children dying from asthma were being treated for their conditions. This is an indication that families may be relying on acute treatments rather than comprehensive plans to manage their children's asthma.

There have not been any reported deaths since 1997 from the once common, vaccine-preventable infectious diseases - polio, chickenpox (varicella), measles, mumps, rubella, diphtheria, tetanus, pertussis (whooping cough), or hepatitis B. The organisms that cause these diseases have not disappeared, however, particularly for pertussis and chickenpox, and both the diseases and related deaths will reemerge if vaccination coverage drops. In 2005-2006, 83% of Nebraska two-year olds had received the chickenpox vaccine, a significant improvement over the 2003 value of 75%. Children who are not vaccinated risk getting the disease as adults when complications are more severe.

Recommendations

To help reduce infant and child death and disability from preventable medical conditions:

- **Healthy children ages 6 months of age and older should receive the annual flu vaccine.** RSV vaccination is strongly recommended for children under 2 years with chronic lung disease and for premature infants with other risk factors.
- All children with cerebral palsy, regardless of severity, should be receiving ongoing care, education and treatment.
- Use of albuterol-based inhalers in an emergency should not be considered effective control of asthma.
- **Parents should be aware of their children's immunization status and keep them up to date.** Vaccinations not only protect children from developing a potentially serious disease but also protect the community by reducing the spread of infectious organisms. Providers can assist by communicating regularly with parents on immunization schedules.

Motor Vehicle-Related Incidents - Key Findings

The third most frequent cause of death to Nebraska's children continues to involve motor vehicles in traffic situations. In 2005 and 2006, 66 children were killed while in a motor vehicle either as a driver or passenger, representing 86% of all motor vehicle-related deaths to children (Table 13). Over half (58%) of the deaths were to teens age 15 to 17 (Figure 17).

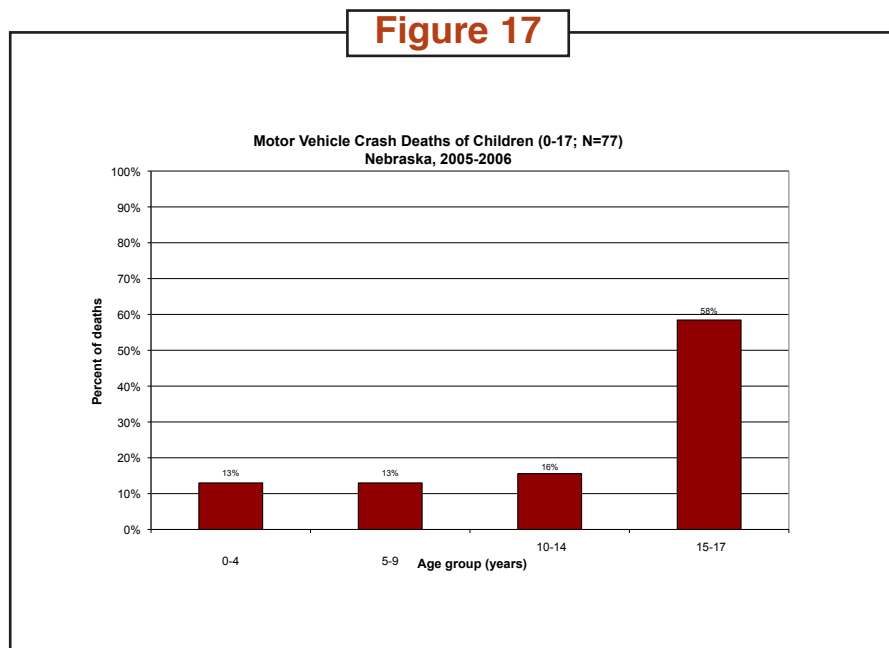
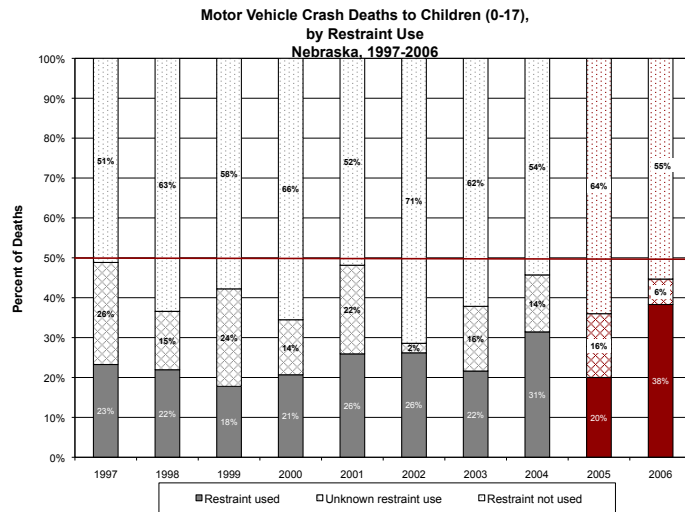


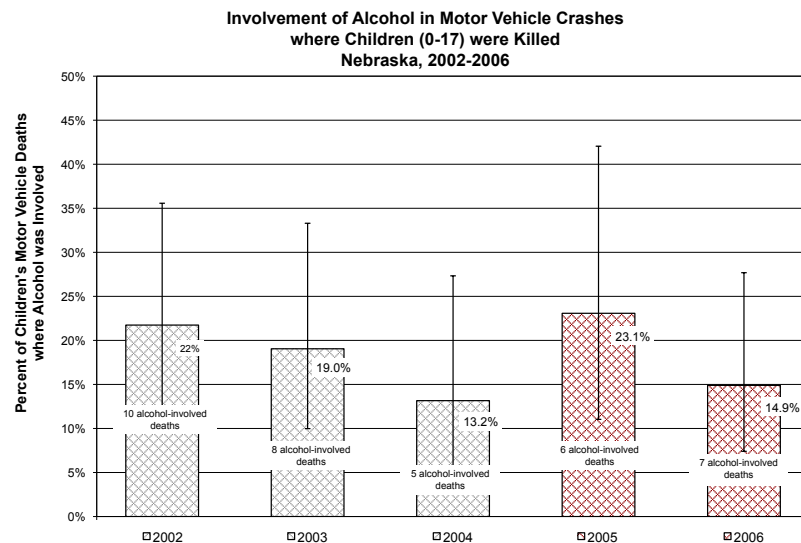
Figure 18



Fifty-eight percent of children who died in car crashes were either unrestrained or ejected from the vehicle.

Alcohol was known to be involved in 23% and 15% of the motor vehicle-related fatalities in 2005 and 2006, respectively, or 18% across the two years.

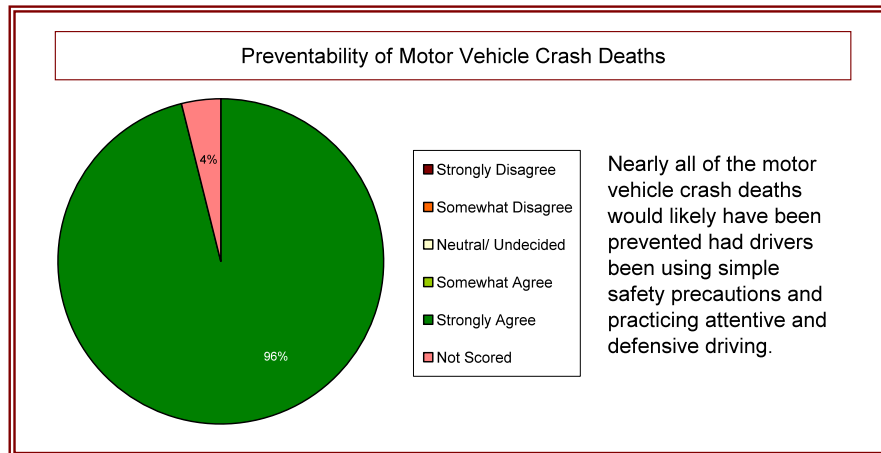
Figure 19



*Alcohol involvement is "Yes" if a driver's or pedestrian's blood alcohol content (BAC) was greater than .010. The 95% confidence intervals around each year's value show no significant change over time.
Source: Nebraska Motor Vehicle Crash Data

Two children were killed as pedestrians and three died in bicycle-related incidents. Four children were killed in All Terrain Vehicle (ATV) incidents; three of these children were under the age of eight and were on adult sized ATVs. Helmets were not worn in any of these incidents (Table 13).

The vast majority of motor vehicle crash deaths were strongly preventable - attributed to driver error or poor judgment along with inexperience.



Discussion. Studies have found that teens understand messages about the dangers of drinking and driving, but aren't as clear about the risks involved with other driver distractions and fatigue. Speed is a major contributor to teen crash fatalities, with risk increasing steadily with each mile per hour over the speed limit. While safety belts cut the risk of death or serious injury in a crash by 45 to 50 percent, teens are less likely to wear safety belts.

Young drivers are subject to a particular paradox when it comes to crash risk - the more they drive and expose themselves to risk on the road, the more chances they have of being in a crash. However, the best way for them to reduce crash risk is by gaining driving experience. Graduated Licensing Laws, which Nebraska implemented in 1999, are one way around this paradox. Since the law took effect, there has been a 51% reduction in fatal and injury crashes among 16 year olds and a 46% reduction in fatal and injury crashes among 17 year olds.⁹ Additional restrictions were placed on young drivers beginning January 1, 2008; these include passenger restrictions and device restrictions. It is important that both teens *and* parents understand and adhere to this law.

ATVs are gaining in popularity each year and can be a useful tool in many circumstances. However, they can also be a very dangerous toy. With engine sizes over 90 cubic centimeters (cc), speeds exceeding 70 mph and weighing hundreds of pounds, ATVs are just not designed for young people. ATV manufacturers and the US Consumer Product Safety Commission recommend that children and young teens be restricted to ATVs with engine sizes of 90 cc or below.

⁹ Incidents in 2006 as compared to 1998.

Children under 16 typically lack the developmental skills to safely drive adult ATVs; younger children lack the physical ability and mental skills to safely maneuver any motorized vehicle with multiple speeds and controls.

The Nebraska Injury Prevention State Plan provides a comprehensive assessment of motor vehicle injuries and recommendations to prevent future injuries. For more information contact the Injury Prevention Program, Nebraska Department of Health and Human Services.¹⁰

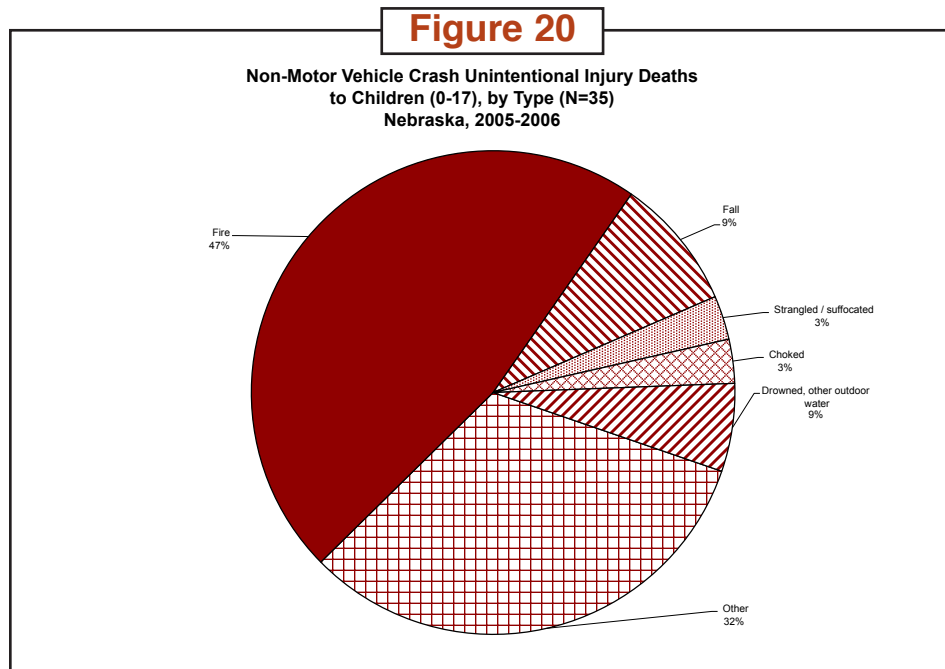
Recommendations *To help reduce infant and child death and disability from motor vehicle-related injuries:*

- **Nebraska's safety belt law should be upgraded to primary (standard) enforcement. Seat belt use should be a primary offense for teen drivers.** The importance of shoulder belts, in addition to lap belts, should be included in educational messages. States with primary enforcement laws have a safety belt usage that is estimated at 15% higher than those without. Safety belts cut the risk of death or serious injury in a crash by 45 to 50%.
- **Child endangerment laws should be considered that provide special sanctions for drivers convicted of DUI with a child in the vehicle.** Currently, 33 states have such laws. Mothers Against Drunk Driving (MADD) cites research showing that, "A child in a vehicle with a drinking driver is not only at risk from the impaired driver, but also from the lack of safety restraint use... as drinking drivers are much less likely to make sure a child is properly restrained."
- **The American Academy of Pediatrics recommends passage of legislation in all states prohibiting the use of 3- and 4-wheeled off-road vehicles (ATV) by children younger than 16 years.** Safe Kids Worldwide and the Consumer Product Safety Commission also recommend that no children under age 16 be allowed to ride an ATV under any circumstances, whether on private or public property. Children do not possess the physical strength, coordination, or judgment necessary to pilot these vehicles safely. Safe Kids concludes "...there is simply no way to make ATV riding a safe activity for children."
- **Children should always use age-appropriate restraints when in a motor vehicle.** Parents should model for teens the importance of wearing safety belts every time they drive or ride in a vehicle.
- **Bicycle helmets should be worn by all persons (i.e., bicycle operators and passengers) of any age whenever and wherever they ride a bicycle.** Bicycle helmets reduce the risk of serious head injury by as much as 85% and the risk of brain injury by as much as 88%.

¹⁰ 402/471-2101; <http://www.hhss.ne.gov/hpe/injury.htm>.

Unintentional Injuries - Key Findings

A total of 34 children died during 2005 and 2006 from unintentional injuries (Table 14; Figure 20). The leading cause of injury was house fires.



Fire

In 2005, four children died in three separate house fires, while in 2006 eleven more were killed in five separate house fires (Table 14). These fires had different causes—a malfunctioning air conditioner, children playing with matches, smoking materials, and a space heater. One additional child died in a car fire.

None of the 15 children killed in house fires were in homes with working smoke detectors.

Discussion. National research shows that a working smoke alarm is not present in two-thirds of the residential fires in which a child is injured or killed. In Nebraska, the owner of a dwelling is responsible for supplying, installing, maintaining, and testing smoke detectors. However, it is the responsibility of the occupant to perform tests on the smoke detector and replace batteries.¹¹

Children, especially those ages 5 and under, are at the greatest risk from home fire-related death and injury, with a fire death rate twice the national average. A less acute perception of danger, less control over their environment, and a limited ability to react promptly and properly to a fire contribute to this excess risk.

¹¹ Nebraska Statute 81-5, 144.

Recommendations *To help reduce infant and child death and disability from building fires:*

- **Communities are encouraged to implement preparation and education programs, including smoke alarm distribution, fire setter prevention and fire intervention programs.** The State Fire Marshal's Office web site includes family-oriented safety tips.¹²
- Family discussions on fire safety will help familiarize young children with what to do during a fire, including practicing an escape plan.

Drowning

Two children drowned during 2005 and 2006 while swimming in open water (lake or reservoir; Table 14; Figure 20). The drowning of four additional young children is included in the Criminal Child Abuse & Neglect, and Supervisory Neglect sections. These cases follow the observed trend where older children drown in open water and younger children drown in swimming pools.

Discussion. Research from the Safe Kids USA found that parents' behavior is drastically different when supervising a school-aged child versus a toddler. While 93 percent of parents felt it necessary to stay in visual contact doing nothing else at all times when supervising a 2-year old, only 80 percent of parents express this same necessity with a 6-year-old and only 42 percent with a 10-year-old.

Water safety considerations include the water environment and child's skill level, not just their age.

Recommendations *To help reduce infant and child death from drowning:*

- **Young teens should not be left alone in potentially hazardous situations such as when swimming in lakes and rivers.** The ability to swim does not replace the need for supervision, even into the teenage years.

Other

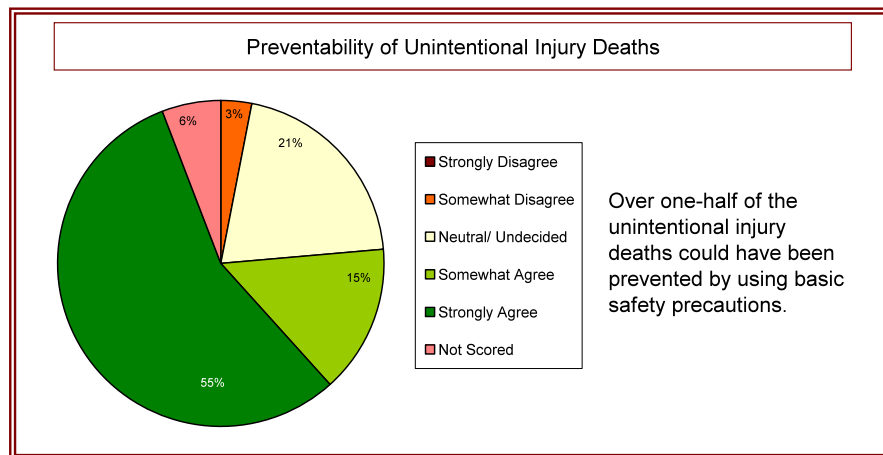
Three children died as a result of unintentional poisoning with over-the-counter or prescription medications (Table 14). One of these children was taking two different over-the-counter medicines which resulted in an overdose. A second overdosed from prescription medication that a parent had been placed in an improperly labeled container. Two additional young children died as a result of falling from a horse. In both incidents, wearing a helmet might have prevented serious injury. Remaining unintentional injury deaths were isolated incidents, most of which were preventable with basic safety precautions including adult supervision, or safety equipment such as skateboarding helmets.

¹² <http://www.sfm.ne.gov/publications/safetyalerts.html>.

Discussion. Nationally, nearly 40% of accidental poisonings of children involve medications. The poison control hotline number is 800-222-1222.

Recommendations *To help reduce infant and child death and disability from poisoning:*

- **The Nebraska Poison Center recommends that medicines and household products be stored in their original containers, locked up, and where children cannot see or reach them.** The National Poison Prevention Planner provides multiple materials for community awareness programs.¹³
- Browsing materials such as the American Academy of Pediatrics' family-friendly series of age-specific child safety tips would help improve families' and caretakers' awareness of common household hazards.¹⁴



Suicide - Key Findings

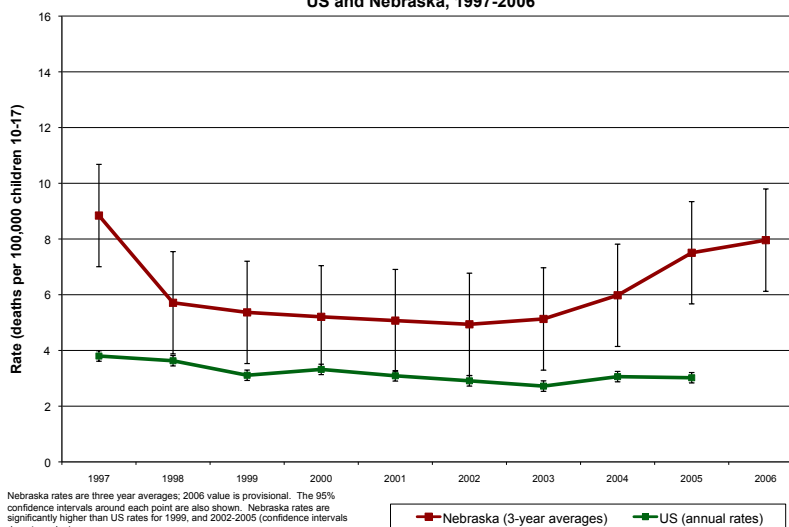
Tragically, at least 36 youth in Nebraska between the ages of 10 and 17 took their own lives during 2005 & 2006. While the actual number of deaths is relatively small, Nebraska's suicide rates for this age group have been significantly higher than national rates since 2002 (Figure 21).

¹³ <http://poisonhelp.hrsa.gov/index.htm>

¹⁴ <http://www.aap.org/family/tippmain.htm>.

Figure 21

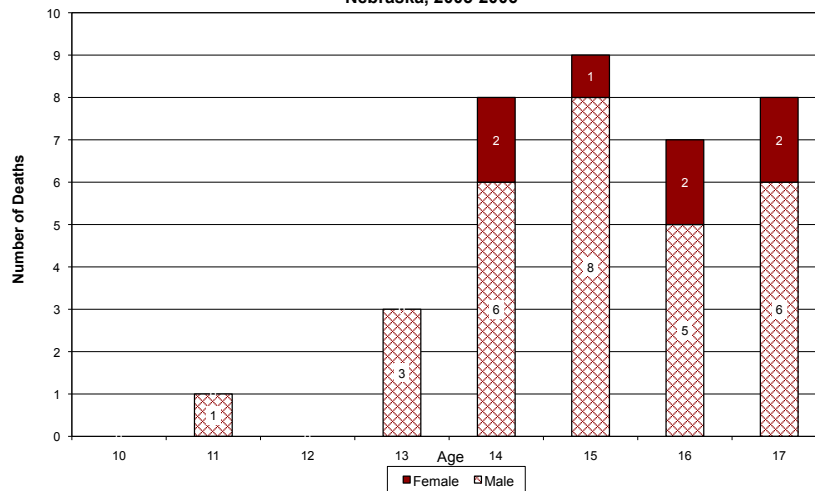
Suicide Rates, Children Ages 10-17
US and Nebraska, 1997-2006



Eighty percent (29) of these deaths were to boys and twenty percent (7) to girls (Table 15); the children were resident in 16 Nebraska counties. The death of an 11-year old was only the second recorded over the last decade (Figure 22, Table 15.). Six (16%) of the teens were American Indian. The previous reported American Indian youth suicide, in 2004, was the first since 1996.

Figure 22

Suicide Deaths to Children (0-17), by Age and Sex (N=36)
Nebraska, 2005-2006



There was a dramatic shift in the method used, from predominately gun-related in 2005 (53%) to hanging in 2006 (74%; Table 15). All firearm deaths were of boys.

Consistent with previous years, youth who have died from suicide tend to fall into three groups:

- youth with identified mental health and / or chemical dependency problems where suicide had previously been identified as a risk;
- youth who had not been diagnosed with a mental disorder but who appeared to struggle socially, behaviorally and academically, and/or lacked a positive peer group; and,
- purely situational cases.

The six American Indian teen suicides during 2005 and 2006 exceed the total reported over the past decade.

Discussion.

The sharp jump in American Indian teen suicides follows a growing number of American Indian adult suicides. Nebraska tribes have begun devoting resources to suicide prevention, including community and school-based forums and training. The economic and social issues that underlie these problems, however, are complex and will not likely disappear quickly.

The decline in the use of firearms for suicide mirrors national trends, possibly reflecting better adult control of these weapons. CDRT reviewers have noted a growing tendency of teens to use the Internet to research their suicide plans, particularly for strangulation methods. Teens' growing familiarity with technology may also be accelerating the risk of suicide for a subset already at high risk; a few of Nebraska's cases had referred to suicide on their MySpace or Facebook social networking internet pages.

To significantly reduce the number of youth who die each year from suicide, communities, schools and parents must be willing to address the issue directly. The stigma of suicide and adults' fear of discussing it with their teens can be dispelled through education and community services. Nationally successful programs such as Signs of Suicide® (SOS) are designed specifically for middle and high school students. Used by more than 3,000 high schools and middle schools nationwide, SOS is the only school-based suicide prevention program to:

- Demonstrate a reduction (40%) in suicide attempts; and,
- Be selected by the U.S. Substance Abuse and Mental Health Services Administration for its National Registry of Evidence-Based Programs and Practices.

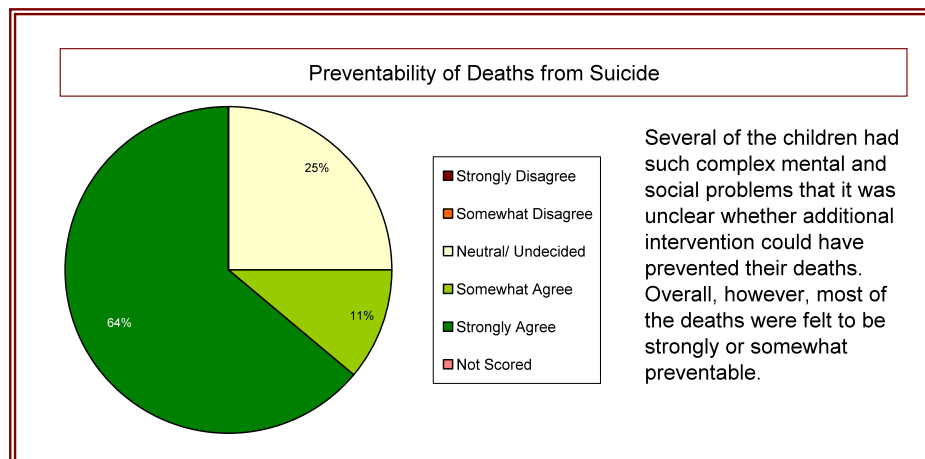
Key components of these programs are education, screening and intervention. They educate students, parents, teachers and the community about signs and symptoms, depression as a treatable illness, knowing how to respond and how to develop a supportive environment for students to get help.

Research is beginning to demonstrate the serious emotional consequences of teen suicide for surviving family members and friends. In many cases, parents or siblings are the first people to find the teen after they have died. It is essential that mental health services are offered immediately and that follow-up services are provided as well.

The risk of adolescent suicide cuts across all racial, ethnic and socioeconomic backgrounds.

Recommendations *To help reduce the risk of child suicide:*

- **All teenagers need access, including financial access to confidential, professional mental health services.** Co-locating mental health professionals with health care providers or within other non-traditional settings may make youth more comfortable accessing these services.
- **The Nebraska Child Death Review Team recommends implementing SOS[®], Columbia University's TeenScreen[®] or similar program at the school level.**¹⁵ Successful evidence-based programs are available that can make a substantial difference in saving children's lives. More information and resources can be found at the Nebraska Statewide Suicide Prevention Coalition's web site, including the State Suicide Prevention Plan.¹⁶

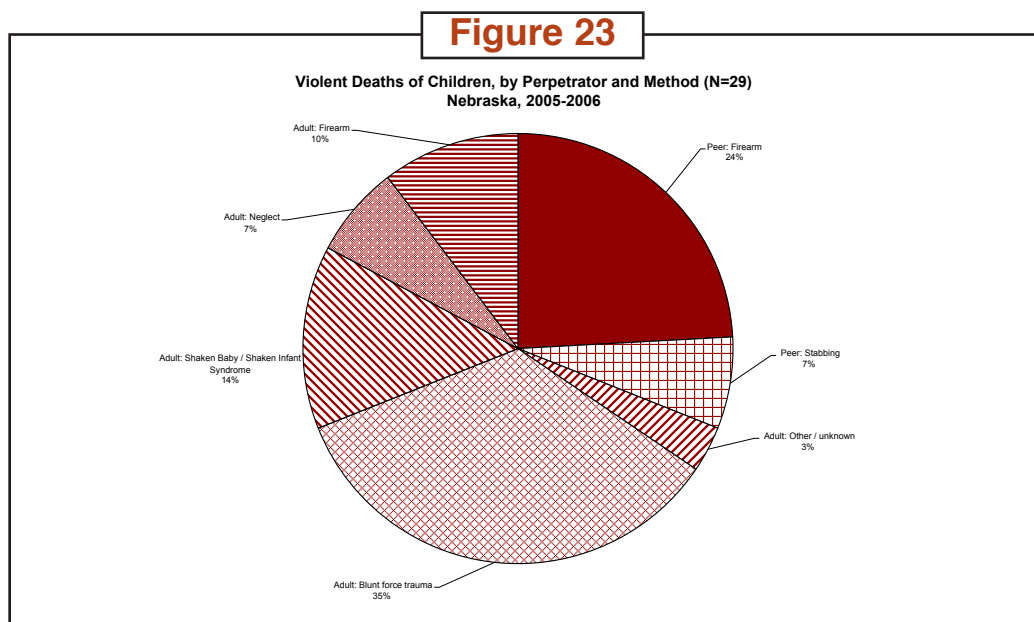


¹⁵ National SOS Program Coordinator 781-239-0071 x117; www.MentalHealthScreening.org.
<http://www.teenscreen.org>.

¹⁶ <http://www.hhs.state.ne.us/beh/mh/suiaalert.htm>.

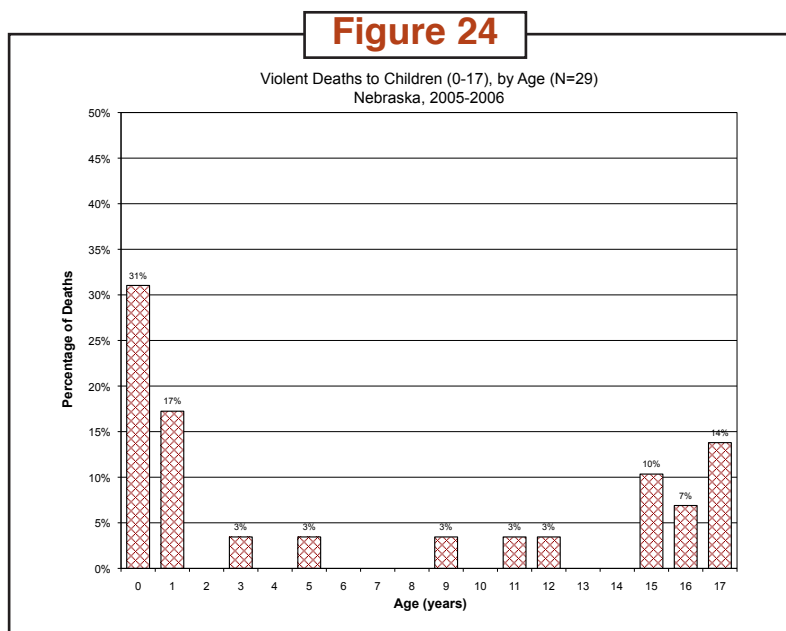
Homicide – Youth Violence / Criminal Child Abuse & Neglect - Key Findings

Twenty-nine children suffered violent, abusive or neglectful deaths during 2005-2006. Ten (35%) of the deaths were to children under age one from child abuse or neglect; another nine (31%) resulted from teen-on-teen (“peer”) violence (Table 16; Figure 23).



Among intentional deaths, 10 were to children ages five and above as a result of firearm use (Table 16; Figure 24). Two of these children, along with their mother, were shot by their father/stepfather (her husband). Two teens died as a result of stabbings.

Among the 16 deaths by child abuse or neglect, two infants in 2005 and again in 2006 were known to have died from Shaken Baby / Shaken Infant Syndrome (SBS). Nebraska has experienced between zero and two *diagnosed* deaths from SBS per year over the past decade. Of remaining child abuse / neglect cases reviewed during this period, most were from blunt force trauma (9 deaths); there was also one death each from asphyxiation by car window and boating without a flotation device. The exact method of injury to one additional infant was unknown.



Discussion – Youth Violence

Nationally, homicide is the third leading cause of death for children ages 10 to 17. For older teens (15-17), it is second only to motor vehicle accidents as a cause of death. Research increasingly shows that family structure and stability, particularly for boys, is an important determinant of adolescents' involvement in violent behavior. Additionally, the availability of guns turns "normal" adolescent conflicts into violent confrontations resulting in serious injury or death. There are many other risk factors that, while not direct causes of violence, increase the likelihood that a young person will become violent. These common risk factors for adolescent violence include:

- History of violent victimization or involvement
- Involvement with drugs, alcohol, or tobacco
- Poor behavioral control
- History of treatment for emotional problems
- Exposure to violence and conflict in the family
- Low parental involvement
- Low emotional attachment to parents or caregivers
- Involvement in gangs
- Lack of involvement in conventional activities
- Substance use; and,
- The availability of guns.

There are multiple resources available to communities wishing to reduce youth violence. The national Surgeon General's Report on Youth Violence (2001) examines youth violence from a public health perspective, with an important focus on protective factors and effective, research-based prevention strategies that can be implemented by parents, schools, and communities. The Guide to Community Preventive Services reviews the effectiveness of community interventions that work to prevent violence through four main approaches: (1) behavioral change interventions, (2) health and education system level interventions, (3) legislation and public policy interventions, and (4) environmental interventions.

- Clear goals and objectives;
- A broad base of community professionals, organizations and parents;
- An understanding of the source of firearms used in crimes; and,
- An understanding of the extent of violence-related injuries as well as deaths.

The US Office of Juvenile Justice has also assessed “best practice” programs that work to strengthen families and parental relationships as a way of preventing juvenile delinquency and substance abuse. For healthy child development, communities must support parents and other adult caretakers of children. Basic support for families includes healthy relationship education, affordable housing, access to health care, employment, quality day care, quality education, and safe neighborhoods. Specific focus should be directed to teenage parents who are at very high risk of having limited parenting skills.

Recommendations *To help reduce death and disability from youth violence:*

- Communities, schools, families and others should understand the risk factors for youth violence and take advantage of the substantial resources available to develop effective prevention programs.
- Community-based support for “Healthy Relationships, Healthy Families” programs will help ensure the best possible outcomes for children.

Discussion – Criminal Child Abuse & Neglect

Child abuse and neglect tended to fall into two categories – those where the perpetrator displayed a chronic lack of caring about the child’s well-being, and acute cases where a normally competent caretaker was unable to handle a stressful situation. Prevention strategies differ for these two situations.

CDRT reviews have also found that alcohol and drugs play large parts in child neglect, inappropriate child care decisions, and fatal child abuse. Actions taken to prevent child deaths resulting from abuse by a caretaker must include strategies to address the problems of substance abuse and domestic violence. Young children should never be left in the care of persons who are not suited to handle the pressures posed by infants.

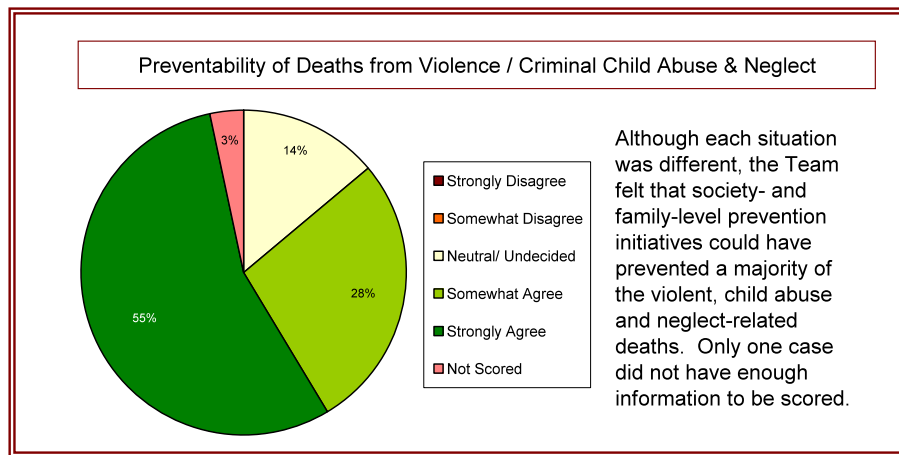
Recommendations *To help reduce infant and child death and disability from child abuse and neglect:*

- **Expanded availability of safe and affordable child care will reduce the number of children left in inappropriate and/or unsafe situations.** Young children should never be left in the care of persons who are not suited to handle the pressures posed by infants.
- “Never, never, never shake a child”¹⁷ is a key community-level message.
- **The ability to swim does not replace the need for personal flotation devices (PFD; “life vests”) on boats and around deep or moving water.** U.S. Coast Guard-approved

¹⁷ “Never, never, never shake a child” is the copyrighted slogan of SBS Prevention Plus; /www.sbsplus.com.

life vests should always be used on boats for children and teens; on docks and riverbanks for young and school age children; and at beaches and swimming pools for young children and nonswimmers. Nebraska law requires children of all ages to wear a Coast Guard type I, II, III or V PFD when operating or riding a personal watercraft.¹⁸

- Statewide, voluntary home visiting programs are needed that provide support and assistance to expecting and new mothers in their homes.
- **There is a need for parent education programs that focus on teen parents or mothers and families with young children.** These programs should be located in accessible areas, for example, in high schools or within substance abuse treatment programs



Caretaker Neglect - Key Findings

Deaths are attributed to caretaker neglect when a child's caretaker(s) knowingly does something that places the child's life in danger or does not remove the child from a dangerous situation. The National Center for Child Death Review recognizes five types of supervisory neglect:

- Failure to protect from hazard
- Failure to provide necessities (food, shelter, other)
- Failure to seek medical care / follow treatment
- Emotional neglect
- Abandonment

Deaths where a caretaker was convicted of child abuse or neglect, or likely would have been if identified, are reported in the category of Criminal Child Abuse / Neglect. CDRT child protection

¹⁸ Nebr. Rev. Stats. §37-1241.02; LB 176 (1999).

specialists individually reviewed all remaining injury deaths to young children for a possible fit with the categories of neglect listed above. For the 2005-2006 reporting period, the Team recognized four cases of failure to protect from hazardous conditions (three by drowning, one by ATV rollover) and one failure to provide for necessities (death from dehydration; Table 17). The children in these cases ranged in age from nine days to five years.

Discussion. Determining when a lack of supervision of small children crosses the line between understandable and negligence is complicated; parental responsibility for supervision is constantly challenged by competing demands. However, the younger the child the less time he/she should be left unwatched and/or unaccounted for. While pool and bath drowning is hardly ever intentional, the three cases in this section resulted from guardians' lack of supervision and attention. The Team also felt that leaving a young child alone at home with knowledge of and access to an ATV also crossed the line.

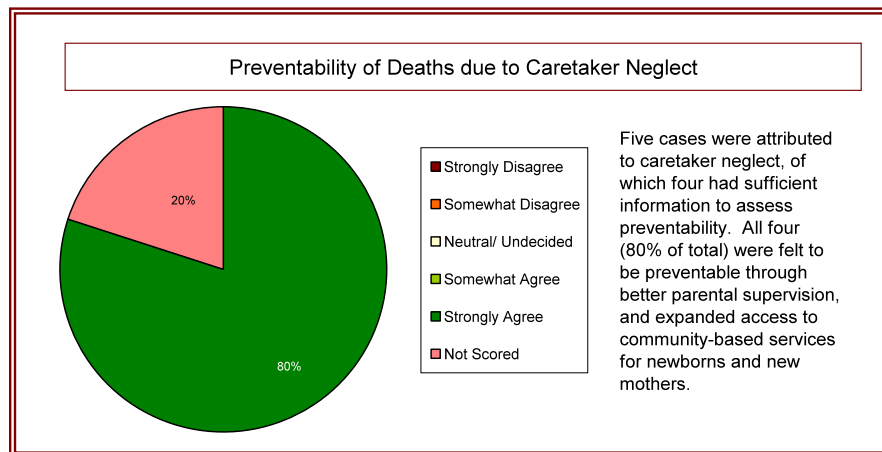
The mother of the infant who died of dehydration appeared to have mental health issues. However, a sufficient number of adults had contact with the infant over the nine days of her life that intervention could have reasonably occurred.

Nebraska's Safe Haven law went into effect in July, 2008, with the intent of providing reluctant parents a means of safely abandoning an infant. Nebraska was one of the last states in the nation to pass such legislation, the intent being to avoid unwanted newborns from being killed or seriously neglected. Because Nebraska's law did not stipulate an age limit, 36 children but no infants had been abandoned under the Safe Haven law by the time the law was amended in November, 2008 to an age limit of 30 days. It remains to be seen how the law affects infant care and wellbeing over the long term.

Recommendations *To help reduce infant and child death and disability from neglect:*

- **Parents and caretakers need to be aware that home or apartment pools are dangerous for small children.** The U.S. Consumer Products Safety Commission provides basic guidelines to protect against child drowning.¹⁹
- Affordable options are needed for the care of young children.
- **The availability of the Safe Haven law for the relinquishment of newborns should be widely publicized.** Despite recent publicity, many prospective users may be unaware of the actual intent of the law.

¹⁹ <http://www.cpsc.gov/cpscpub/pubs/359.pdf>



Substance Use During Pregnancy

Nationally, between 5.5% and 18% of all births are thought to be affected by illegal drug use during pregnancy. Established delivery and neonatal complications from illegal drugs such as cocaine and methamphetamine include premature rupture of membranes (PROM), placental abruption, preterm delivery, and pre-eclampsia-like symptoms. However, because these problems also occur in non-drug using women, it is difficult to state with certainty when an infant's or child's death was directly related to the mother's drug use.

The deaths of two children were most likely related to the physiologic effects of maternal substance use during pregnancy (Table 18).

Recommendations	<i>To help reduce infant and child death and disability from maternal prenatal substance use:</i>
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- **Delivery personnel should be able to recognize and report Fetal Alcohol Syndrome and other disorders related to prenatal alcohol consumption.** Accurate knowledge of the prevalence of FAS will aid in its treatment and prevention.
- **Specialized resources are needed for substance-addicted pregnant women who are trying to quit.** Providers should be aware of available referral options.
- **Women are more likely to abstain from drinking during pregnancy when their partner also accepts the need to do so.** There is no known safe amount of alcohol to drink while pregnant, nor does there appear to be a safe time to do so.

Medical Error

Although several deaths in 2005-2006 occurred under circumstances where the available information indicated less-than-optimal medical care was delivered, the one that clearly rose to the level of medical error involved an anesthesiology error during surgery.

Undetermined

The cause of death of four children remained officially undetermined, even after extensive law enforcement and medical investigations. Circumstances in these cases were such that neither medical causes nor inflicted injuries could be ruled out. Three of these cases are cross-listed in the SIDS/SUID section, including the two children who were above the age limit for SIDS. The final case involved a teen found in a hot tub, with no indication of either having drowned or having a medical condition.

No information available

There were no deaths during 2005-2006 where the Team was unable to obtain at least minimal cause of death information.

ACTIONS TAKEN ON RECOMMENDATIONS FROM PREVIOUS ANNUAL REPORTS

Regarding Pregnancy-Related Deaths

1. (Providers) Continuing education on cause of death determination should be provided to all persons who fill out death certificates. (1996-2001, 2002-2003, 2004)

Update: The CDRT continues to sponsor workshops on accurate determination of cause of death, and how to fill out death certificates. The workshops are oriented towards physicians, county attorneys, and coroners.

2. (Providers) Preconception care should be considered a vital and routine aspect of care for all reproductive age women.

Update: The Nebraska Department of Health and Human Services (DHHS) is beginning an information campaign for women, men, and providers, promoting a life-course approach to pre- and inter-conception health. During the next two years, social marketing will test messages and communications methods. Training and technical assistance will then be provided to health, human service, and education providers and communities on the life-course framework and on effective messaging.

Regarding SIDS and Infant Suffocation

3. (State Policy Makers) Infants in child care facilities should be put to sleep on their back unless there is a documented medical reason why the child should sleep in a different position. Regulations for child care facilities that require crib “bumper pads” and that allow stuffed toys in cribs should be repealed. (1996-2001, 2002-2003, 2004)

Update: The Child Care Licensing Program (DHHS) has submitted statewide regulations for licensed child care requiring that infants be put to sleep on their backs in the absence of a specific waiver, specifying appropriate sleep surfaces for infants and children, and prohibiting toys and blankets in cribs. As of January, 2009, the regulations were at the Governor’s Policy Research Office awaiting approval for public hearings.

4. (State Policy Makers) State-level funding should support work to reduce the prevalence of smoking among pregnant and postpartum women. (1996-2001, 2002-2003) Programs are needed that specifically target smoking among pregnant and postpartum women. (2004)

Update: The Nebraska Tobacco Quitline offers free, telephone-based cessation counseling services for up to five counseling sessions, and has tailored protocols for pregnant women. As of December, 2008, Nebraska Medicaid program also covers cessation medications for postpartum women (age 18 and older), although not pregnant women due to concerns about medications during pregnancy.

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5. (State Policy Makers) A standardized death scene investigation should be conducted for all unexpected child deaths. (1996-2001, 2002-2003, 2004)

Update:

- A Nebraska Child Death Scene Investigation Protocol is being finalized by the Nebraska Attorney General's office and will be distributed to county and local law enforcement agencies.
6. (Community Organizations and Child Advocates) Existing SIDS prevention regulations, messages and initiatives should be expanded to include other "Safe Sleeping" issues and options. (1996-2001, 2002-2003, 2004)

Update:

- Nebraska Revised Statutes §71-2101- §71-2104 (2006), require hospitals to offer written material and a video presentation to new parents on safety measures which can be taken to prevent sudden infant death, and the dangers associated with infants sleeping in the same bed with other children or adults. DHHS produced and distributed a video titled "Safe Sleep for Your Baby" and companion brochures, both in English and Spanish.
- DHHS continues to publicize the availability of new resources for SIDS prevention, and promoting existing hot lines, help lines and the www.dhhs.ne.gov/SIDS web site. A press release titled "Chief Medical Officer Warns About the Danger to Infants of Bed-sharing" appeared in several newspapers across the State in March, 2008, and a letter sent from DHHS Directors to approximately 1,800 Nebraska health care providers encouraged them to give clear and consistent messages to parents of newborns.
- The Baby Blossoms Initiative, a coalition of individuals in Douglas County Nebraska, including Charles Drew Hospital, Omaha Healthy Start, Visiting Nurses Association, Nebraska Health & Human Services, Douglas County Health Department and others, continues its work to promote safe sleep messages to child care providers, health care facilities and parents in Douglas County.

Regarding Infectious, Chronic and Other Medical Conditions

7. (State Policy Makers) A statewide registry to track immunizations would allow for better development of prevention strategies against existing and emerging diseases. (2002-2003)

Update: The Nebraska Immunization Program has obtained public access software and is currently training schools in its use. The NIP is hoping to begin adding private health clinics to the system in 2009.

Regarding Motor Vehicle Crash Deaths

8. (State Policy Makers and Communities) Upgrade Nebraska's Graduated Licensing Provisions.

(1996-2001, 2002-2003)

Update: Nebraska Revised Statutes §60-4,120.01 (2007) strengthens the requirements for provisional licenses, including increasing the number of practice driving hours, limiting the number of non-family member passengers, restricting driving after 12 midnight, and prohibiting the use of a cell phone while driving.

9. (Parents) A child who has outgrown a child safety seat (generally at 40 pounds) should use a booster seat until approximately age 8 or 80 pounds and/or 4'9" tall. (1996-2001, 2002-2003)

Update: LB 254, to increase required use of a passenger restraint system to age eight, was not adopted by the 2007/2008 Nebraska Unicameral.

10. (Parents) Parents should be aware of the high potential for serious injury and even death when ATVs are ridden or operated by children under 16. ATVs should be operated only on designated trails, not on public roads, paved surfaces or fields. (1996-2001, 2002-2003, 2004)

Update: Nebraska Revised Statutes §60-6,356 (2007) gives cities authority over all-terrain vehicles within the corporate limits of the city. Cities may pass local ordinances that allow all terrain vehicles on city streets; however, they may not be driven on controlled access highways nor cross a controlled-access highway with more than two marked traffic lanes.

Regarding Child Abuse and Neglect Deaths

11. (State Policy Makers and Communities) Statewide, voluntary home visiting programs are needed that provide support and assistance to expecting and new mothers in their homes. (1996-2001, 2002-2003, 2004)

Update: In 2008, DHHS issued five contracts for nearly four million dollars over two years to provide home visitation programs in 15 areas of the state: Burt, Cedar, Cuming, Dixon, Douglas, Hall, Howard, Lancaster, Madison, Merrick, Nancy, Sarpy, Stanton, Thurston and Wayne counties. Studies indicate that home visitation services result in better birth outcomes, enhanced parent and child interactions, early detection of developmental delays and a reduction in frequency and severity of maltreatment. As of September 2008, approximately 180 families had been referred for services.

12. (Communities and Parents) “Never, never, never shake a child©.”²⁰ (1996-2001, 2002-2003)

Update:

- DHHS continues to promote the “You Have the Power to Protect a Child” campaign,²¹ developed in response to recommendations made by the Children’s Task Force. The campaign is focusing on raising public awareness on four topics: child abuse prevention, shaken

²⁰ “Never, never, never shake a child” is the copyrighted slogan of SBS Prevention Plus.

²¹ <http://www.hhss.ne.gov/ProtectAChild/index.htm>

baby syndrome, domestic violence, and substance abuse (specifically methamphetamine); and includes television and radio spots, newspaper ads, and posters and brochures.

- The Nebraska Child Abuse Prevention Fund Board (NCAPFB) provides grants to local communities and agencies for child abuse prevention activities. During 2007, NCAPFB awarded approximately \$168,000 to 11 programs for these activities.
- In 2006, the Nebraska Department of Health and Human Services, Nebraska Children and Families Foundation and the Nebraska Child Abuse Prevention Fund Board formed the Nebraska Statewide Prevention Partnership. This Partnership is committed to increasing public awareness of child abuse, delivering child abuse prevention “best practice” models to local communities, building community capacity to increase protective factors, strengthening families by support, and encouraging community-based partnerships. The Partnership’s goal is to reduce child abuse in Nebraska by 20 percent by the year 2020.

The Partnership’s 2008 public awareness campaign, “Rethink Your Reaction,” focused on positive parenting. Rethink Your Reaction is a campaign to promote safe and healthy family interaction by encouraging parents and caregivers to find positive outlets for anger, frustration or anxiety when stress threatens to get the better of them. The campaign includes posters, newspaper ads, brochures and a community “toolkit.”²²

13. (State Policy Makers and Communities) Broad-based public education efforts are needed to draw attention to suicide as a significant and preventable cause of death for youth, create awareness of signs that indicate risk for individual youth, and encourage help-seeking actions when at-risk youth are identified. (1996-2001, 2002-2003, 2004)

Update:

- The State Suicide Prevention Coalition continues to work with schools and communities toward implementing the SOS Program (Signs of Suicide) or the Teen Screen Program.
- The Omaha Nation Community Response Team received a State/Tribal Youth Suicide Prevention Grant from SAMSHA in 2008. The funding amount is \$500,000 each year for 3 years.

²² http://www.nebraskachildren.org/resources_tools/resources2.html.

M ethodology

In making its assessments, the Team obtains information from multiple sources, including:

- The Vital Records section of the Nebraska Department of Health and Human Services (DHHS), which provides death certificates for all Nebraska resident children under the age of 18, and matched birth certificates for those under the age of one year;
- County Attorneys, who are contacted annually for information on all deaths to children who resided in their respective counties;
- Hospitals, which are contacted annually for information on all deaths to children that occurred in those facilities;
- The DHHS Office of Protection and Safety and the Child Care Licensing section;
- Additional sources as needed, e.g., private providers, public officials in counties or states where a death occurred but where the child was not a resident.

The annual State of Nebraska Vital Statistics Reports provide categorized cause of death information for infants and older children. However, the CDRT review determines underlying causes that do not always correspond to those assigned by Vital Statistics, as the Team tends to reach further back in the chain of events that led to the death to assign an underlying cause. As the goal of the CDRT is prevention of future deaths, this process was felt to better distinguish between preventable and non-preventable deaths.

The Team also uses DHHS electronic databases, including children's birth and death certificates. Numbers and names of Sudden Infant Death Syndrome (SIDS), suicide, homicide and criminal child abuse cases were compared to ensure that all children known to the state were listed appropriately in the CDRT files. Similarly, the state's Cancer Registry is used to cross-check cancer deaths. The Nebraska Crash Outcome Data Evaluation System (CODES) database provides aggregate data on passenger restraint (e.g., seatbelt) use and the involvement of alcohol in automobile crashes. CODES data were not individually matched to CDRT cases but do provide an aggregate assessment of the same children and incidents. Finally, in a small number of cases, the only information available was obtained from archived newspaper reports.

Using this information, the CDRT Coordinator reviewed all cases and classified them into one of 16 categories based on the "underlying" cause and circumstances of death.²³ Because information

²³ The underlying cause of death is the disease or condition that initiated the chain of morbid events leading directly to death, and may be many years removed from the actual occurrence of death. See Glossary for further discussion.

was incomplete for some children, some misclassification may have occurred. Team members discussed cases where the classification was not immediately obvious or was controversial.

All unintentional injuries (“accidents”) to young children, child abuse cases and suicides were reviewed by at least two Team members to determine whether caretaker neglect may have been involved.

All rates were calculated using the most recent population estimates from the U.S. Census Bureau. Because these estimates are updated periodically, rates shown for any given year may vary slightly from those published in a previous report.

Glossary

Births

Apgar Score

Newborn viability is most often assessed by the Apgar score. The Apgar score is a widely used assessment of the physical condition of a newborn infant based on heart rate, muscle tone, breathing effort, color and reflex responsiveness. Scores are assessed at 1, 5 and 10 minutes after birth. A score of 10 suggests the healthiest infant, and scores below 5 indicate that the infant needs immediate assistance in adjusting to his or her new environment. The Apgar test is non-invasive and does not involve risk to the newborn.

Birth Defect / Congenital Anomaly

A birth defect is an abnormality of structure, function or metabolism (body chemistry) that is present at birth. Birth defects may be caused by chromosomal or “hereditary” errors or by other influences on the fetus during gestation. They are the leading cause of death for infants. The March of Dimes groups birth defects in three main categories:

- Structural/metabolic (e.g., neural tube defects, missing organs),
- Congenital infections (e.g., Rubella (German measles), syphilis), and
- Other (e.g., Fetal Alcohol Syndrome (FAS)).

For this report, birth defects are only categorized as such if there was no known cause for their occurrence. For example, defects resulting from congenital infections are considered under Maternal Complications; defects resulting from FAS are under Maternal Substance Use.

Gestation

The gestational age of the newborn is the interval between the first day of the mother’s last normal menstrual period (LMP) and the date of birth. It is typically determined by maternal recall, but can also be determined by clinical examination if the mother’s information is not available or is inconsistent with the fetus’ or newborn’s size.

Live Birth

The state of Nebraska defines a live birth as “The complete expulsion or extraction of a product

of conception from its mother, irrespective of the period of gestation, which, after such separation, breathes or shows any other evidence of life such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached, and is reportable.”

Premature birth

Premature birth is a leading cause of infant mortality, yet little is known on how to prevent it. A normal gestation is defined as 37 to 41 weeks; an infant born at 37 or fewer weeks of gestation is considered premature. Through 37 weeks, major systems and organs are still developing. However, babies with at least 28 weeks of gestation are considerably more likely to survive; each additional week of gestation improves the likelihood of survival and decreases the probability of lifelong disabilities. Multiple gestation pregnancies (twins, triplets, etc.) are more likely to deliver prematurely. The prematurity rate is the number of live births of 37 weeks or less gestation divided by the total number of live births.

Viable

Capable of living; born alive and with such form and development of organs as to be capable of living.

Death / Mortality

Cause of Death

The *immediate* cause of death is the disease (condition) or complication occurring closest to the time of death that leads to or contributes to death, and is classifiable according to the International Classification of Diseases (ICD) system. The State of Nebraska used the Ninth Revision for deaths up until 1998, and the Tenth Revision since 1999. However, the immediate cause of death does not necessarily reflect the complete set of reasons for the death. The *underlying* cause of death is the disease or condition that initiated the train of morbid events leading directly to death, and may be many years removed from the actual occurrence of death.

Although immediate causes of death are often preventable, underlying causes are more informative for primary prevention purposes as defined by the Team. For example, pneumonia deaths are largely preventable. However, when pneumonia is the immediate cause of death in a child who is ventilator dependent due to cerebral palsy, prevention of infantile or childhood cerebral palsy becomes the larger, long-term focus. Similarly, while massive head trauma may be an immediate cause of death, prevention of the motor vehicle crash that caused the trauma is as important as improved emergency medical care.

Manner of Death

The manner of death is important and distinct from the cause of death. Manner of death is typically classified as:

Natural
Accidental
Homicide
Suicide
Undetermined
Unknown / No Answer

Fetal Death

The state of Nebraska follows the National Center for Health Statistics' definition of a fetal death as "... death prior to²⁴ the complete expulsion or extraction from its mother of a product of human conception, irrespective of the duration of pregnancy and which is not an induced termination of pregnancy. The death is indicated by the fact that after such expulsion or extraction, the fetus does not breathe or show any other evidence of life such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles."

Neonatal Death

Death of a live born infant under 28 days of age.

Perinatal Death

Death of a fetus after 28 weeks or more of gestation or of a live born infant within seven days of life.

Medical Conditions

Cancer / Malignant Neoplasms

Cancer begins in cells, the building blocks that make up tissues. Normally, cells grow and divide to form new cells as the body needs them. When cells grow old, they die and new cells take their place. When new cells form that the body does not need and old cells do not die when they should, these extra cells can form a mass of tissue called a growth or tumor. Not all tumors are cancer. Tumors can be benign or malignant:

²⁴ Emphasis added.

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- Benign tumors are not cancer
 - Benign tumors are rarely life-threatening.
 - Usually, benign tumors can be removed, and they seldom grow back.
 - Cells from benign tumors do not spread to tissues around them or to other parts of the body.
 - Malignant tumors are cancer
 - Malignant tumors generally are more serious than benign tumors. They may be life-threatening.
 - Malignant tumors often can be removed, but they can grow back.

Hypoxia / Asphyxia

Hypoxia is an insufficient supply of oxygen to the brain. The American Academy of Pediatrics states that an infant who has had “asphyxia” or hypoxia immediately prior to or during delivery that is severe enough to result in acute neurologic injury should demonstrate all of the following: (a) profound metabolic or mixed acidemia (ph <7.00) on an umbilical arterial blood sample, if obtained, (b) an Apgar score of 0 to 3 for longer than 5 minutes, (c) neurologic manifestation, e.g., Seizure, coma, or hypotonia, and (d) evidence of multiorgan dysfunction. Because this level of detail was rarely available for this report, the physician’s or pathologist’s assessment was accepted.

Neural tube defect(s)

The neural tube is the part of the developing fetus that becomes the spinal cord and brain. Neural tubes close within the first four weeks of gestation, often before a woman knows she is pregnant; neural tube defects (NTD) occur when the tube only closes partially or not at all. NTDs are among the most common of all serious birth defects.

The two major types of NTDs are anencephaly and spina bifida. Anencephaly is the partial or complete absence of the baby’s brain. This defect causes extensive damage, and most of these babies are stillborn or die soon after birth. Spina bifida occurs when an opening remains in the spine. These babies need surgery soon after birth to close the spine and prevent further damage. They also may need a shunt or a drain to prevent a build-up of spinal fluid in the brain called hydrocephalus. Babies with spina bifida may lack feeling in their legs and later develop problems with walking. In addition, these children may develop problems with their bowel and bladder control. They may also have learning problems, and some have mental retardation.

Sudden Infant Death Syndrome (SIDS)

SIDS is officially defined as the sudden death of an infant less than one year of age which

remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of the death scene, and review of the clinical history. In Nebraska, only the autopsy is required.²⁵ Major risk factors for SIDS are pre- or post-natal exposure to tobacco smoke, low birth weight, not breast-feeding, and the baby not sleeping on his/her back. SIDS is intended to be a diagnosis of exclusion, when no legitimate cause of death can be determined by autopsy or other means.

Trisomy

Trisomies are genetic conditions present at birth where cells contain three copies of specific chromosomes instead of the normal two copies. For example, the presence of three copies of chromosome 21 is called Trisomy 21. A partial trisomy occurs when part of an extra chromosome is attached to one of the other chromosomes. A mosaic trisomy occurs when not all cells contain the extra chromosomal material. Trisomies can result in birth defects, miscarriage or early infant death.

Other Terms

Bed sharing vs. Co-sleeping

These terms are often used interchangeably, which adds confusion to an already complex subject. The CDRT follows the general public health consensus that bed-sharing refers to sleeping on the same surface with a person or animal, whereas co-sleeping refers to being in the same room but not the same surface. The surface involved might be a bed, but could also be a futon, mattress, sofa, chair and so on. The dangers of sudden infant death are applied to bed sharing, not co-sleeping.

Preventability

The Team focuses on identifying deaths that could have been prevented under Nebraska's definition:

“Preventable child death shall mean the death of any child which reasonable medical, social, legal, psychological, or educational intervention may have prevented. Preventable child death shall include, but not be limited to, the death of a child from (a) intentional and unintentional injuries, (b) medical misadventures, including untoward results, malpractice, and foreseeable complications, (c) lack of access to medical care, (d) neglect and reckless conduct, including failure to supervise and failure to seek medical care for various reasons, and (e) preventable

²⁵ Nebr. Rev. Stat. §71-605.

premature birth; Reasonable shall mean taking into consideration the condition, circumstances, and resources available.” §71-3405 Neb. Rev. Stat.

While preventability is often a straightforward assessment, it can also be quite challenging. For example, if a seizure disorder has been controlled with medications yet causes a 17-year old driver to have a fatal motor vehicle crash, preventability becomes problematic. As a result, the Nebraska Child Death Review Team uses a 5-point Likert Scale of preventability. For each case reviewed, reviewers assessed whether they:

Strongly Disagreed	Somewhat Disagreed	Neutral / Undecided	Somewhat Agreed	Strongly Agreed
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with the statement

- This death was preventable - standard-of-care medical management would have changed the circumstances that led to death (Medical cases);
- or,
- This death was preventable - an individual or community could reasonably have done something that would have changed the circumstances that led to death (Non-medical cases).

Race and Ethnicity

Nebraska assigns infant race and ethnicity at birth as that of the mother as reported on the birth certificate. Ethnicity and race are overlapping categories and are thus reported separately. For the time period of these data (2005-2006), Nebraska recognized four racial categories: White, African-American, American Indian and Asian / Pacific Islander.

Risk Factor

There is a distinct difference between a “risk factor” for a disease and a “cause” of that disease. A “cause” refers to something that leads to something else with some degree of certainty through a recognized series of normal or abnormal events. For some diseases or conditions, however, such causes remain unknown and possible chains of events are only hypotheses or theories. Therefore public health workers talk about “risk factors,” factors that are found more frequently in a group of people with a certain problem than in a group of people without that particular problem. The connection between the risk factor and the problem is not always obvious. Some risk factors are not at all modifiable, such as sex and birth year. Others are categorized as such because, for instance, once an infant is born its birth weight and gestational age can not be changed even though they may place the infant at risk for other diseases. However, some risk factors can be modified, for example, sleeping position, use of car restraints, vaccination status.

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Appendix – Detailed Data Tables

Table 1.

Underlying Cause of Death	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2005 - 2006 Subtotal
	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)	(N)
Preterm Birth	51	40	39	47	34	44	24	45	31	32	63
Maternal Complications	24	34	29	38	46	35	34	37	37	30	67
Complications of Labor & Delivery	9	5	9	4	5	7	1	2	1	0	1
Other Pregnancy & Neonatal-Related Conditions	9	6	4	1	5	0	0	3	0	3	3
Total, Pregnancy-Related	93	85	81	90	90	86	59	87	69	65	134
Pregnancy Related	93	85	81	90	90	86	59	87	69	65	134
Birth Defects / Inherited & Chromosomal Disorders	56	57	59	66	69	68	61	74	42	60	102
SIDS / SUID	23	25	24	27	26	19	23	18	33	20	53
Cancer / Neoplasms	9	11	11	11	8	12	9	19	18	7	25
Infectious, Chronic & Other Medical Conditions	17	26	29	20	22	27	17	17	19	18	37
Motor Vehicle Crash	43	43	47	36	38	44	48	40	33	44	77
Non-MVC Unintentional Injuries	17	17	19	19	11	17	15	22	13	21	34
Suicide	13	10	13	11	9	12	10	10	17	19	36
Homicide / Criminal Child Abuse & Neglect	14	9	8	14	7	13	15	13	10	19	29
Caretaker Neglect	3	5	8	6	3	4	3	0	3	2	5
Maternal Substance Use	5	2	0	0	1	0	2	0	2	0	2
Medical Error	0	0	2	0	2	1	0	0	0	1	1
Undetermined	0	0	1	0	0	0	0	1	1	2	3
Pending	1	0	1	1	2	5	5	1	0	0	0
No Information Available	2	10	0	0	0	0	0	0	0	0	0
Total (N)	296	300	303	301	288	308	267	302	260	278	538

Underlying Cause of Death	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2005 - 2006 Subtotal
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Preterm Birth	54.8%	47.1%	48.1%	52.2%	37.8%	51.2%	40.7%	51.7%	44.9%	49.2%	47.0%
Maternal Complications	25.8%	40.0%	35.8%	42.2%	51.1%	40.7%	57.6%	42.5%	53.6%	46.2%	50.0%
Complications of Labor & Delivery	9.7%	5.9%	11.1%	4.4%	5.6%	8.1%	1.7%	2.3%	1.4%	0.0%	0.7%
Other Pregnancy & Neonatal-Related Conditions	9.7%	7.1%	4.9%	1.1%	5.6%	0.0%	0.0%	3.4%	0.0%	4.6%	2.2%
Total, Pregnancy-Related	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Pregnancy Related	31.4%	28.3%	26.7%	29.9%	31.3%	27.9%	22.1%	28.8%	26.5%	23.4%	24.9%
Birth Defects / Inherited & Chromosomal Disorders	18.9%	19.0%	19.5%	21.9%	24.0%	22.1%	22.8%	24.5%	16.2%	21.6%	19.0%
SIDS	7.8%	8.3%	7.9%	9.0%	9.0%	6.2%	8.6%	6.0%	12.7%	7.2%	9.9%
Cancer / Neoplasms	3.0%	3.7%	3.6%	3.7%	2.8%	3.9%	3.4%	6.3%	6.9%	2.5%	4.6%
Infectious, Chronic & Other Medical Conditions	5.7%	8.7%	9.6%	6.6%	7.6%	8.8%	6.4%	5.6%	7.3%	6.5%	6.9%
Motor Vehicle Crash	14.5%	14.3%	15.5%	12.0%	13.2%	14.3%	18.0%	13.2%	12.7%	15.8%	14.3%
Non-MVC Unintentional Injuries	5.7%	5.7%	6.3%	6.3%	3.8%	5.5%	5.6%	7.3%	5.0%	7.6%	6.3%
Suicide	4.4%	3.3%	4.3%	3.7%	3.1%	3.9%	3.7%	3.3%	6.5%	6.8%	6.7%
Homicide / Criminal Child Abuse & Neglect	4.7%	3.0%	2.6%	4.7%	2.4%	4.2%	5.6%	4.3%	3.8%	6.8%	5.4%
Caretaker Neglect	1.0%	1.7%	2.6%	2.0%	1.0%	1.3%	1.1%	0.0%	1.2%	0.7%	0.9%
Maternal Substance Use	1.7%	0.7%	0.0%	0.0%	0.3%	0.0%	0.7%	0.0%	0.8%	0.0%	0.4%
Medical Error	0.0%	0.0%	0.7%	0.0%	0.7%	0.3%	0.0%	0.0%	0.0%	0.4%	0.2%
Undetermined	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%	0.3%	0.4%	0.7%	0.6%
Pending	0.3%	0.0%	0.3%	0.3%	0.7%	1.6%	1.9%	0.3%	0.0%	0.0%	0.0%
No Information Available	0.7%	3.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total (N)	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 2.

Underlying Cause of Death	2005-2006					
	Preterm		Not Preterm / Unknown Gestational Age (N)		Subtotal	
	N	%	N	%	N	%
Maternal Complication	63	50.0%	4	100.0%	67	51.5%
Prematurity, no cause identified	63	50.0%	0	0.0%	63	48.5%
Total (N)	126	100%	4	100%	130	100%
		96.9%		3.1%		

Table 3.

Maternal Complications	2005	2006	Total
	N	N	
Diabetes, IDDM	2	0	2
Hypertension, pregnancy-induced or chronic	1	1	2
Incompetent cervix	10	8	18
Infection / chorioamnionitis	11	2	13
Infection, CMV	1	0	1
Infection, Group B strep	1	1	2
Infection, HIV	1	0	1
Infection, toxoplasmosis	1	1	2
Infection, other*	1	2	3
Placenta previa	0	1	1
Placental abruption / separation / infarct	5	11	16
Pre-eclampsia / eclampsia	1	1	2
Vaginal bleeding	1	1	2
Other / unknown	1	1	2
Total (N)	37	30	67

*Bacterial vaginosis, parvovirus (5th disease), pneumonia (unspecified).

Table 4.

Preterm Birth	2005	2006	Total	
	(N)	(N)		
Singleton gestation	13	21	34	54.0%
Multiple gestation	18	11	29	46.0%
Total (N)	31	32	63	100.0%
Complicated Labor & Delivery	2005	2006	Total	
	(N)	(N)		
Perinatal hypoxia / asphyxia (38 wks gestation)	1	0	1	
Total (N)	1	0	1	
Other pregnancy-related and neonatal issues	2005	2006	Total	
	(N)	(N)		
Meconium peritonitis (27 wks gestation)	0	1	1	
Neonatal Haemophilus influenzae (35 wks gestation)	0	1	1	
Persistent pulmonary hypotension (41 wks gestation)	0	1	1	
Total (N)	0	3	3	

Table 5.

Birth Defects / Inherited & Chromosomal Disorders	2005				2006				Total	
	Preterm (<37 wks) (Age ¹)	Not Preterm (37+ wks) (Age)	Unknown gestational age (Age)	Subtotal (N)	Preterm (<37 wks) (Age ¹)	Not Preterm (37+ wks) (Age)	Unknown gestational age (Age)	Subtotal (N)	(N)	(%)
Beckwith-Widemann Syndrome				0		24d		1	1	1.0%
Blood disorders				0			8y	1	1	1.0%
Bone disorders				0	0d, 0d, 3m	14d, 1m		5	5	4.9%
Cerebral palsy, infantile				0				0	0	0.0%
Chromosomal anomaly, Trisomy 13 (Patau syndrome)	0d	0d, 1m		3	5d		3m	2	5	4.9%
Chromosomal anomaly, Trisomy 18 (Edwards syndrome)	0d			1	0d	16d, 1m		3	4	3.9%
Chromosomal anomaly, Trisomy 21 (Down syndrome)	4d, 11d			2	0d, 6d, 10m			3	5	4.9%
Chromosomal anomaly, other	7d	9d		2		0d, 7m		2	4	3.9%
Dandy Walker Syndrome		2y		1				0	1	1.0%
DiGeorge Syndrome				0	7m	6m		2	2	2.0%
Gastrointestinal / genitourinary malformations	0d, 3m	0d, 1d	4y	5	0d	0d, 0d, 12d	2m, 10m	6	11	10.8%
Head / brain anomalies, hydrocephaly				0	0d		14y	2	2	2.0%
Head / brain anomalies, other	1d			1	2m	1d		2	3	2.9%
Heart disease, hypoplastic left		0d, 1m, 1m, 6m		4	0d			1	5	4.9%
Heart disease, other	4d	7d, 1m, 1m, 2m, 5m, 6m	15y	8	1d	9d, 1m, 5m, 6m, 9m, 1y		8	16	15.7%
Hydrops, non-immune	0d, 1d			2	0d			1	3	2.9%
Joubert Syndrome		1m		1				0	1	1.0%
Kidney defect / anomaly		0d, 9m		2	0d, 0d, 0d, 0d, 10d			5	7	6.9%
Limb-wall defect				0		0d		1	1	1.0%
Lung defect / anomaly	14d			1				0	1	1.0%
Metabolic disorder				0		1y	6y	2	2	2.0%
Mitochondrial disorder			10y	1				0	1	1.0%
Multiple congenital anomalies	0d, 0d, 10d, 1m,		13y	5	0d, 0d, 9d	0d, 3y		5	10	9.8%
Muscular dystrophy			15y	1		3y		1	2	2.0%
Neural tube defect, anencephaly		0d		1	0d, 0d			2	3	2.9%
Neural tube defect, myelomeningocele / spina bifida				0	0d	1y		2	2	2.0%
Neurofibromatosis, Type 1		8y		1				0	1	1.0%
Neuromuscular disorder				0	2d, 5m			2	2	2.0%
Sandhoff Disease				0		4y		1	1	1.0%
Total (N)	16	21	5	42	28	26	6	60	102	

¹"0" refers to death the same day as birth; d=days, m=months, y=years.

Table 6.

Sleep-Associated Death – Diagnoses	2005		2006		Subtotal	
	VR	CDRT	VR	CDRT	VR	CDRT
SIDS / SUID	31	29	19	15	50	44
Suffocation	2	3	1	2	3	5
Respiratory arrest	0	0	1	0	1	0
Medical condition	0	0	0	0	0	0
Not an infant*	0	1	0	2	0	3
Undetermined	1	1	1	3	2	4
Total (N)	34	34	22	22	56	56

*Cases are reported in the Undetermined section, and omitted from subsequent SIDS/SUID analyses.

Table 7.

Sleep-Associated Death – Race / Ethnicity	2005			2006			Subtotal		Total	(%)
	SIDS	Other Diagnoses	Subtotal	SIDS	Other Diagnoses	Subtotal	SIDS	Other Diagnoses		
White	21	3	24	12	2	14	33	5	38	71.7%
African-American	5	0	5	4	0	4	9	0	9	17.0%
Native American	3	0	3	1	1	2	4	1	5	9.4%
Asian	1	0	1	0	0	0	1	0	1	1.9%
Total (N)	30	3	33	17	3	20	47	6	53	100.0%
	90.9%	9.1%		85.0%	15.0%		88.7%	11.3%		
Hispanic Ethnicity	3	0	3	0	0	0	3	0	3	5.7%

Table 8.

Sleep-Associated Death – Sex	2005			2006			Subtotal		Total	(%)
	SIDS	Other Diagnoses	Subtotal	SIDS	Other Diagnoses	Subtotal	SIDS	Other Diagnoses		
Male	18	1	19	11	1	12	29	2	31	58.5%
Female	12	2	14	6	2	8	18	4	22	41.5%
Unknown	0	0	0	0	0	0	0	0	0	0.0%
Total (N)	30	3	33	17	3	20	47	6	53	100.0%
	90.9%	9.1%		85.0%	15.0%		88.7%	11.3%		

Table 9.

Sleep-Associated Death – Caretaker	2005			2006			Subtotal		Total	(%)
	SIDS	Other Diagnoses	Subtotal	SIDS	Other Diagnoses	Subtotal	SIDS	Other Diagnoses		
Babysitter / Child Care	7	0	7	3	0	3	10	0	10	18.9%
Parents / Family member	21	2	23	11	3	14	32	5	37	69.8%
Other	0	1	1	0	0	0	0	1	1	1.9%
Unknown	2	0	2	3	0	3	5	0	5	9.4%
Total (N)	30	3	33	17	3	20	47	6	53	100.0%
	90.9%	9.1%	100.0%	85.0%	15.0%	100.0%	88.7%	11.3%	100.0%	

Table 10.

Sleep-Associated Death – Risk Factors	2005			2006			Subtotal		Total	(%)
	SIDS	Other Diagnoses	Subtotal	SIDS	Other Diagnoses	Subtotal	Official Diagnosis = SIDS	Other Diagnoses		
Age-inappropriate sleep surface	18	1	19	6	2	8	24	51.1%	3	50.0%
Pre- or post-natal smoke exposure	13	1	14	10	1	11	23	48.9%	2	33.3%
Bed-sharing	15	1	16	6	2	8	21	44.7%	3	50.0%
Found on side or stomach	17	1	18	5	0	5	22	46.8%	1	16.7%
Current / recent respiratory infection	15	2	17	5	0	5	20	42.6%	2	33.3%
Put to sleep on side or stomach	8	0	8	5	1	6	13	27.7%	1	16.7%
Bedding-related issues	4	0	4	3	0	3	7	14.9%	0	0.0%
Furniture-related issues	1	0	1	0	0	0	1	2.1%	0	0.0%
No known risk factors	2	0	2	2	0	2	4	8.5%	0	0.0%

Table 11.

Cancer / Neoplasms	2005	2006	Total
	Age (yrs)	Age (yrs)	
Adrenal gland			0
Blastoma, unspecified			0
Brain tumor (total)	7	2	
Astrocytoma / glioma	4, 11, 15, 15	9, 14	6
Brain stem, unspecified			0
Choroid plexus	8		1
Ependymoma			0
Medulloblastoma	4, 8		2
Rhabdoid			0
Unspecified			0
Ewing's sarcoma			0
Hepatic carcinoma / hepatoblastoma	2	NB, 14	3
Leukemia, acute lymphocytic	7, 15		2
Leukemia, acute lymphocytic, long-term complications from chemotherapy	7		1
Leukemia, myeloid lymphocytic	13		1
Lymphoma, Hodgkin's			0
Lymphoma, non-Hodgkin's ("lymphoblastic)			0
Mesothelioma, peritoneal			0
Neuroblastoma	3, 8, 17	5	4
Neuroendocrine tumor			0
Osteosarcoma		17	1
Palate tumor			0
Pelvic sarcoma			0
Pineal gland dysgerminoma			0
Renal medullary carcinoma			0
Rhabdoid tumor of the kidney			0
Rhabdomyosarcoma	4	15	2
Wilms' tumor	7, 12		2
Unspecified type			0
Total (N)	18	7	25

Table 12.

Infectious, Chronic and Other Disease Conditions	2005	2006	Total
	(N)	(N)	
Asthma, treated*	1		1
Asthma, treatment unknown		1	1
Bronchitis / bronchiolitis/ bronchopneumonia	2	1	3
Cerebral palsy (complications)	5	3	8
Encephalitis / encephalopathy		1	1
Epilepsy	1		1
Epstein Barr virus		1	1
Gastroenteritis	1		1
Herpes encephalopathy	1		1
Kidney disease, unknown cause		1	1
Liver failure, other / unknown cause	2	1	3
Myocarditis, diffuse or lymphocytic	1	1	2
Necrotizing enterocolitis	1		1
Necrotizing pancreatitis	1		1
Pneumonia / pneumonitis, non-specific	1	1	2
Pneumonia, aspiration		1	1
Pneumonia, cytomegalovirus		1	1
Pneumonia, MRSA-related		1	1
Pneumonia, influenza A		1	1
Pneumonia, respiratory syncytial virus (RSV)		1	1
Rotavirus		1	1
Seizure disorder, unknown origin	1	1	2
Wegener's granulomatosis	1		1
TOTAL	19	18	37

*Possibly non-compliant.

Table 13.

Motor Vehicle-Related Incidents ¹	2005	2006	Total
	(N)	(N)	
Motor Vehicle Crash - Restraint status ²			
Restrained	6	14	20
Not restrained	8	18	26
Ejected	7	5	12
Unknown	5	3	8
MVC Subtotal	26	40	66
Other Motor Vehicle-Related Incident			
Pedestrian	1	1	2
Bicycle	2		2
Motorcycle		1	1
All-Terrain Vehicle	2	2	4
School bus			0
Train-car			0
Train-pedestrian/bicycle	1		1
Vehicle fire			0
Other (golf cart)	1		1
Other Subtotal	7	4	11
Total (N)	33	44	77

¹Only includes motor vehicles engaged in traffic. Categories refer to the location of the child.

²Age-appropriate restraints: car seat or booster seat for children through age eight; seatbelt and/or shoulder harness for older ages.

Table 14.

Unintentional Injury	2005 (Age)	2006 (Age)	Total
Athletic injury	10y		1
Choked on food/toy	4y		1
Drowned, open water (swimming / boating)	13y	16y	2
Drug abuse / overdose - oxycodone		17y	1
Fall from and/or stepped on/fallen on by horse	4y	2y	2
Fall from playground equipment		12y	1
Fire, house/trailer/apartment*	3m & 3y, 4y, 7y	3y; 3y & 4y & 5y; 2y & 6y & 10y; 1y & 12y; 15y & 17y	15
Fire, car	13y		1
Hit / crushed by farm or construction vehicle, not in traffic	12y		1
Hyperthermia / overexertion		11y	1
Lightning strike		14y	1
Poisoning, unintentional, over-the-counter or prescription medication	13y, 17y	14y	3
Skateboarding / Snowboarding		13y, 14y	2
Sledding		15y	1
Suffocation, not sleep-related	4m		1
Total (N)	13	21	34

*Deaths connected with "&" are from the same incident.

Table 15.

Suicide		Firearms (Age)		Hanging (Age)		Overdose (Age)		Other (Age)		Subtotal (N) %	Total (N) %
1997	Male	12, 14, 15, 16, 16, 17, 17		13		-		17		9 69.2%	13 10%
	Female	17		-		14, 16, 16		-		4 30.8%	
1998	Male	14, 15, 15, 16, 16		14, 17		-		16		8 80.0%	10 8%
	Female	16, 16		-		-		-		2 20.0%	
1999	Male	15, 15, 16		15, 15, 15, 16, 17, 17		-		14, 17		12 92.3%	13 10%
	Female	-		15		-		-		1 7.7%	
2000	Male	13, 17, 17, 17, 16		14, 16		16		-		8 72.7%	11 9%
	Female	14, 16		17		-		-		3 27.3%	
2001	Male	14, 15, 15, 15, 16, 16, 17		-		-		-		7 77.8%	9 7%
	Female	15		14		-		-		2 22.2%	
2002	Male	16, 16, 17		11, 12, 15, 17, 17, 17		16		13		11 91.7%	12 10%
	Female	16		-		-		-		1 8.3%	
2003	Male	12, 13, 13, 16, 17		15		-		17, 17		8 80.0%	10 8%
	Female	-		-		-		14, 16		2 20.0%	
2004	Male	13, 17		13, 14, 16, 17		-		15		7 70.0%	10 8%
	Female	16		15		-		16		3 30.0%	
2005	Male	14, 14, 15, 15, 16, 16, 16, 17, 17		11,14,14,17						13 76.5%	17 14%
	Female			14, 15				14,16		4 23.5%	
2006	Male	15, 15, 16, 17		13, 13, 13, 14, 14, 15, 15, 15, 15, 16, 17, 17						16 84.2%	19 15%
	Female			16, 17		17				3 15.8%	
Subtotal (N)	Male	50	86.2%	39	83.0%	2	33.3%	8	61.5%	99 79.8%	124 100%
	Female	8	13.8%	8	17.0%	4	66.7%	5	38.5%	25 20.2%	
Total (N)		58	47%	47	38%	6	5%	13	10%	124	100%

Table 16.

Intentional injury	2005 (Age)	2006 (Age)	Total
Criminal child abuse or neglect (alleged or convicted)			
Asphyxiated by car window	1y		1
Blunt force trauma	6m, 6m, 1y	28d, 9m, 10m, 1y, 1y, 1y	9
Boating without floatation device		8y	1
Shaken Baby / Shaken Infant Syndrome	2m, 4m	2m, 5m	4
Unknown	3m		1
Subtotal (N)	7	9	16
Homicide / manslaughter (alleged or convicted)			
Blunt force trauma		12y	1
Firearm	5y, 16y	9y, 11y, 15y, 15y, 16y, 17y, 17y, 17y	10
Stabbing	15y	17y	2
Subtotal (N)	3	10	13
Total (N)	10	19	29

Ages are given in years (y), months (m) and weeks (wks).
Cases separated by "&" refer to siblings.

Table 17.

Parental / Caretaker Neglect	2005 (Age)	2006 (Age)	Total (N)
Failure to protect from hazard			
Drowned (apartment pool, home pool, bath)	2y	1m, 3y	3
ATV rollover	5y		1
Failure to provide necessities			
Dehydration	9d		1
Total (N)	3	2	5

Table 18.

Maternal Substance Use	2005 (Age)	2006 (Age)	Total (N)
Cocaine / crack	10min		1
Methamphetamine	9y		1
Total (N)	2	0	2

ADA/AA/EOE

The Nebraska Health and Human Services System is committed to affirmative action/equal employment opportunities and does not discriminate in delivering benefits or services.

